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WORKING PLAN

FOR THE FORESTS OF THE

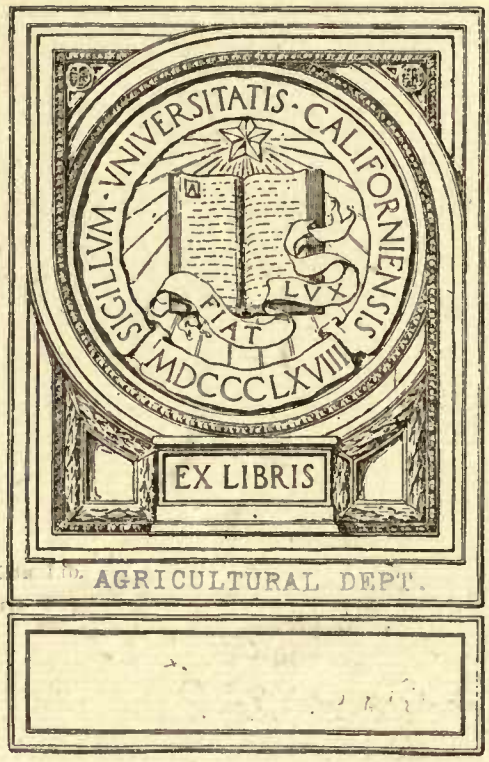
DAMOH FOREST DIVISION,

NORTHERN CIRCLE, CENTRAL PROVINCES,

FOR THE PERIOD

1899-1900 to 1928-29.

Allahabad
PRINTED AT THE PIONEER PRESS
1900



AGRICULTURAL DEPT.

Central provinces, India. Forest dept.

Extract from the Proceedings of the Officiating Chief Commissioner, Central Provinces, in the Revenue Department, No. 3786, *dated the* 31*st July* 1901.

READ—

Working-plan Report for the Forests of the Damoh Forest Division in the Northern Circle.

READ ALSO—

Letters Nos. 145-W. P. and 40-W. P., dated the 26th October 1900 and 20th March 1901, respectively, from the Inspector-General of Forests, and enclosures.

RESOLUTION.

The Inspector-General of Forests has recommended the plan subject to certain remarks. The Officiating Chief Commissioner considers that sufficient effect has now been given to the Inspector-General's suggestions, and he sanctions the Working-plan in its modified form with effect from the commencement of the open season of 1901-02. A list of Addenda and Corrigenda to the Working-plan is attached.

ORDER.—Ordered, that a copy of this Resolution be forwarded to the Government of India, in the Department of Revenue and Agriculture, for information and transmission to the Inspector-General of Forests, and to the Officers noted in the margin.

Conservator of Forests, Northern Circle.
Commissioner, Jubbulpore Division.
Deputy Commissioner, Damoh.
Reporter on Economic Products to the Government of India.

[True Extract.]

H. A. CRUMP,

Chief Secretary to the Chief Commissioner,

Central Provinces.

UNIV. OF CALIFORNIA

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Agric. dept.

No. 145-W.P., dated Simla, the 26th October 1900.

From—H. C. HILL, Esq., Inspector-General of Forests to the Government of India,

To—The Secretary to the Honourable the Chief Commissioner, Central Provinces.

In accordance with Article 88 of the Forest Department Code, I have the honour to forward, for the orders of the Honourable the Chief Commissioner, a working-plan (with five tracings) for the forests of the Damoh Division, received from the Conservator, Northern Circle, under cover of his letter No. 6858, dated the 4th ultimo, a copy of which is appended. I approve of its provisions and beg to recommend the plan for adoption with effect from 1900-01.

2. With regard to what is stated in paragraph 55 of the report concerning the obstacle to forest trade, I beg to refer you to paragraph 3 of my letter No. 112-W. P., dated the 15th August last, respecting the Jubbulpore working-plan, and to say that the remarks made in that case apply equally as well in this instance.

No. 6858, dated Jubbulpore, the 4th September 1900.

From—E. E. FERNANDEZ, Esq., Conservator of Forests, Northern Circle, Central Provinces,

To—The Inspector-General of Forests to the Government of India.

In continuation of correspondence resting with your letter No. 81-W. P., dated the 1st June 1900, and in accordance with Article 88 (i) of the Forest Department Code, I have the honour to submit, herewith, in duplicate, for approval and transmission to the Honourable the Chief Commissioner, the finally printed working-plan for the forests of the Damoh Division. The comments of the Deputy Commissioner and Commissioner thereon will be forwarded in due course when they have been received in this office.

2. With respect to the remarks contained in paragraph 2 of your letter cited above, I beg to solicit perusal of paragraph 3 of my letter No. 6859 of this date. For easy reference a copy thereof is attached hereto.

3. In regard to paragraph 3 of your letter, your wishes have been complied with, and the list of marketable products has been relegated among the appendices as Appendix V. I beg, however, to repeat here the remarks made in paragraph 5 of my letter referred to in the preceding paragraph. A copy of those remarks is appended for ready perusal.

4. Lastly, with reference to paragraph 4 of your letter, I beg to say that the authority which prescribed the rates given in the appendix in question (now Appendix VII) and the date from which they came into force cannot be given. Each year rates are fixed by the annual plans of operations, but as conditions change during the year or are better understood, modifications are sanctioned by the Conservator from time to time.

5. I beg that sanction may be accorded to bring the working-plan into force from the commencement of the open season of 1900-01.

No. 40-W. P., dated Calcutta, the 20th March 1901.

From—H. C. HILL, Esq., Inspector-General of Forests to the Government of India,

To—The Secretary to the Honourable the Chief Commissioner, Central Provinces, Revenue Department.

In continuation of this office letter No. 145-W. P., dated the 26th October 1900, I have the honour of reporting, for the information of the Honourable the Chief Commissioner, that I have had under consideration the views of the Deputy Commissioner of Damoh and of the Commissioner of Jubbulpore in regard to the working-plan for the forests of the Damoh Forest Division, as set forth in their letters marginally noted (copies of which are enclosed for ready reference). I have also received the representation of the Conservator contained in his letter No. 148, dated 4th February 1901, a copy of which is also enclosed.

No. 4650, dated 5th November 1900, from Deputy Commissioner, Damoh, to Commissioner, Jubbulpore.

No. 10967, dated 13th November 1900, from Commissioner, Jubbulpore, to Conservator of Forests, Northern Circle, Central Provinces.

2. I accept the view of the Commissioner expressed in paragraph 6 of his letter, and consider that the sub-division of the *nistar* areas into numerous working series to be gone over on a rotation of five years may be dispensed with. The Conservator's proposal to "pollard" by felling at 2 or 3 feet from the ground is a retrograde measure, which I am unable to support, except in so far as it is provided for in paragraph 80 of the working-plan. The trees cut in the *nistar* tracts should, as far as possible, be so cut as best to favour the production of healthy coppice shoots. Under the circumstances described, I see no objection to certain areas being fired under the supervision and orders of the officers of the Department. The kind of protection contemplated cannot be thoroughly effective, and the protection of lac-producing areas will doubtless be rendered more certain by the deliberate burning under control of the grass on the adjacent lands. There is no prohibition to fell on *nistar* lands during the rains.

3. To paragraph 76 may be added "where, however, the demand for poles is in excess of the demand for fuel, the 'coupe' of one year in advance may be indented upon." This goes some way to meet the suggestion made in paragraph 7 of the Conservator's letter, and may help to meet requirements for poles; but it seems to me that after the first year of cutting poles from two coupes there must be some restriction in supply, unless indeed the felling of poles were to be allowed to proceed over the forests at twice the prescribed rate which would be inadmissible.

4. The rules under paragraph 78 should, in my opinion, stand and not be altered purely with a view to obtaining more revenue as proposed by the Conservator.

5. The regular felling-series are grouped into three working-circles, and the working-plan does not prescribe, as the Conservater supposes, that forms Nos. 2 and 3 should be drawn up and submitted to the Conservator for each felling-series, but that such forms should be kept up in the Divisional Office for each series. These forms will be submitted to the Conservator for each working-circle, and it does not appear that the keeping up of the forms for each series will cause much additional work in the Divisional Office. As the *nistar* areas will not be sub-divided into series, they will be formed into one working-circle for which the prescribed forms will be drawn up. Many of the plans of the operation forms* seem to me unnecessary, and the others are not required if the prescribed forms and Forest Journal, are properly and fully kept up.

*Herewith sent.

6. I approve of the Conservator's proposal in paragraph 10 of his letter, to limit the prescriptions contained in paragraphs 108 to 110 of the plan to the coupes of the regular felling-series.

7. The Conservator proposes in the last paragraph of his letter that the estimate of revenue should be reduced, although he acknowledges that the amount given by Mr. Fernandez in the plan may some day be obtained. There is no need for any such alteration as proposed, because forecasts of revenue and expenditure given in a working-plan are merely estimates and cannot be considered as prescriptions.

No. 148, dated Camp, the 4th February 1901.

From—J. A. McKee, Esq., Conservator of Forests, Northern Circle, Central Provinces,

To—The Inspector-General of Forests to the Government of India.

In this office No. 6858 of the 4th September last, to your address, forwarding for approval, a working-plan for the forests of the Damoh District, my predecessor, Mr. Fernandez, mentioned that the comments of the Deputy Commissioner and Commissioner thereon would also be forwarded when received. Criticisms by these officers were subsequently received in this office on the 16th of November, but were not forwarded for your information, and this point was only recently brought to my notice after I had learned that the working-plan report had been approved by you and despatched to the Honourable

the Chief Commissioner for sanction. I then addressed the Secretariat, representing the above facts and suggesting that, as I also had some remarks to offer regarding the doubtful expediency of certain prescriptions recorded in the plan, a further reference should be made to you on the subject before the plan was finally confirmed. It is in consequence of receiving the Honourable the Chief Commissioner's permission to make these suggestions that I am now addressing you.

2. Adverting first of all then to the Commissioner's objections, two in number, which will be found recorded in the attached copy of that officer's No. 10967 of the 15th November 1900, Mr Fuller argues (1) that considering the inferior type of the forests to be dealt with and the small demand on them for anything but grazing, dry fuel and grass, it is unnecessary to divide the *nistar* areas, as is prescribed in the plan, into 69 series containing the large number of 345 compartments, all of them subject to a system of closure for five years after being worked over. The Commissioner desires to see all these areas, as a whole, thrown open permanently for the removal of all *nistar* requirements, as he thinks the amount of protection afforded by the five-year's closure too insignificant to be of practical use. Mr. Fuller also advocates (2) that as these *nistar* areas are valuable chiefly for grazing, and are not to be given any fire-protection, except such as can be obtained without burning fire-traces and appointing fire-patrols (classed as C protection in paragraph 96 of the plan) it will be better to allow such areas to be burnt under departmental direction, especially as he thinks that grazing is improved by an occasional firing of the grass.

3. The forests tracts in question are those alluded to in paragraphs 67 and 72 of the plan; they are coloured yellow in the maps and aggregate 398,921 acres, or about four-fifths of the whole forest area of the district; and their character and composition, for the most part, fall under type iii, paragraph 36 of the plan. Briefly, they are of very poor character, and in regard to timber supply only a very limited demand.

4. The plan prescribes no restriction on grazing in these areas, nor on the collection and removal from them of dry material and grass. But paragraphs 72 and 73 provide for dividing them into numerous series (69), each of which is to be sub-divided into five compartments, of which one will be opened each year for felling green timber other than certain good kinds which are to be reserved—paragraph 67.

5. Now, personally, I am inclined to think that, considering no protection whatever is to be afforded these compartments from grazing, which is admittedly heavy, no systematic attempt will be made to protect them from fire; and that, as the period of closure is to be limited to five years, the utility of the arrangement seems rather doubtful. I question whether, under the prescribed conditions, which concentrate the fellings over certain open compartments each year, the damage done to the resulting coppice re-growth will not be greater than if those fellings were distributed over the whole *nistar* series, as they otherwise would be, always remembering that there will be no protection from cattle and fire in either case. The only reason given, so far as I can see for the proposed arrangement is to secure for the timber fellings a certain amount of supervision—see paragraph 72. But it seems to me possible that the greater amount of care thus obtained will really tend to the future detriment of the regrowth, strange as this may seem; for if the open areas are to be continually grazed over, as is considered unavoidable, the coppice would probably, I think, have a better chance of survival and escape from injury, if the trees were felled two or three feet from the ground, according to usual village practice, than were they to be felled flush with the ground as is contemplated by the precaution of concentrating the fellings over certain open areas. At any rate, it seems to me that the large amount of work that will certainly be entailed by the proposed sub-division of the *nistar* compartments, will not be compensated for by any equal sylvicultural benefit to the forests. I shall be obliged if you will be good enough to decide this point, after reading my remarks further on regarding the large increase of office work resulting from the arrangement—paragraphs 9 and 10. Personally, I think that all these so-called *nistar* series might be grouped into one class in each circle and called the "grazing series"; that no sub-division of such areas is required in regard to their timber outturn, which is so small as to be of no practical account (under half a cubic foot per acre per annum) and that certainly no sub-division is required for the exploitation of any other product, because the plan allows dry material and grass to be removed from them and grazing to be exercised within them, as a whole, without any restriction whatever.

6. Regarding the Commissioner's second objection connected with fire-protection, it is necessary to remark that lac cultivation is now being carried on over a considerable area of this poor kind of forests and that fires are very damaging, because when fierce enough, they entirely destroy the lac, and when of moderate strength, they kill the insects and hinder the future spread of the material. There are extensive tracts no doubt, especially in the Northern Range, which are nearly worthless for anything except grazing, and where there can be no departmental objection, in my opinion, to systematic firing,

which, I think, improves grazing land. I can point to areas where the grass has become perfectly unfit for pasture, owing to long continuous fire-protection; and under any circumstances, in these *nistar* areas, where no protective arrangements are contemplated, it is quite certain that a large extent of forest land will be burnt over each year. Perhaps therefore the best arrangement will be to attempt no kind of fire-protection in these *nistar* compartments, except where lac is being cultivated, or, in such other areas, as shall be chosen for protection by the Divisional Officer because of specially good forests. But it should be understood that the areas which may be burnt should be fired only under the supervision and orders of the Department.

7. I now wish to draw your attention to certain other prescriptions in the plan which, in my own opinion, require some modification.

Paragraph 76 requires that no coupe in the regular felling series shall be opened until all the area of the coupe still under working has been gone over.

This prescription is already causing both loss of revenue and inconvenience to trade, as I have personally seen during my recent tour in the district. In many places, the pole demand is much greater than the full capability of the open coupes; and in order to supply it, it will be necessary for a new coupe to be opened every year, as allowed in the felling scheme—paragraph 84. But as the fuel demand can generally be supplied by working over one-quarter or one-half a coupe, it will take two or more years to completely work over the whole area for both poles and fuel, and, until this is done, all pole felling in any forward coupe has been prohibited. The idea is to completely work over the forests in a consecutive manner and to avoid patch work. But the loss of revenue and inconvenience entailed by the method causes, in my opinion, an unnecessary sacrifice without obtaining any real sylvicultural advantage. For the extent of improvement we are able to carry out must be regulated by the demand. We cannot afford to spend money on a mere cultural operation; and it seems to me that the net result to the forests will be just the same, if the improvement is made over one-third of each of the 30 compartments comprising the series, as if it were made over the whole of 10 compartments; while by the former system we shall have worked over the whole 30 compartments for poles, whereas by the prescribed method we shall work over only a fraction of the area for this particular material during the period of the present rotation.

I advocate that, where the demand requires it, a new coupe for pole fellings should be opened every year, although it may be found convenient to continue fuel fellings for two or perhaps for three years in any single coupe, and I therefore suggest that section 76 should be added to as follows:—

" Where, however, the pole demand is in excess of the fuel demand, the next forward coupe may be opened for supplying poles, although fuel fellings are still in progress in the back coupe. Fuel fellings should not be allowed to fall more than two years behind the pole fellings, otherwise the closure from grazing will not be of sufficient length to establish the coppice re-growth."

8. My attention has also been drawn to paragraph 78 (i) and (ii), which rules, in the opinion of the Divisional Officer, are likely to act injuriously on revenue receipts if strictly observed. In the coupes of the regular felling series, as already above mentioned, it is extremely difficult to supply the full pole demand, owing to the scarcity of good material. But if all promising trees of timber-yielding species are to be reserved from felling as prescribed, unless there are so many of them as to admit of a thinning being performed, it will be impossible to supply any considerable portion of the pole demand, as there are very few localities where such a thinning can be given effect. Moreover, having regard to the fact that the demand is for poles of small dimensions and that there is little hope of the reserves growing into big timber—see paragraph 66 of the plan—it seems to me that, where only a limited number of good poles are present in the coupe, it will be well to remove at least half of them for sale and to allow some of the inferior trees to remain as seed-bearers. This may be opposed to strict sylvicultural method, but in the present circumstances of the circle, it behoves us, I think, to consider also the financial aspect, and I shall be glad if you will favour me with your instructions on the point. I would suggest altering the wording of Rule (ii) as follows:—

" All fruit trees in good bearing condition and such promising trees of timber-yielding species as can be spared without unduly restricting the trade demand for poles."

9. I now come to what in my opinion are the prescriptions most open to criticism in the plan. Please read paragraph 107, which prescribes that, in addition to Code control forms 2, 3 and 33, certain other statements connected with the plan of operations shall also be kept up in the Divisional Office, and therefore in subordinate offices, for each felling series. The forms in question are 18 in number, and samples of them are herewith attached for your information and inspection. Many of them are voluminous in detail, and it will, I think, be readily understood that, when these forms have to be kept posted for

each of the 82 felling series comprised in the plan, the amount of extra office work entailed both on the divisional and subordinate establishments must be excessive. If only Code forms 2 and 3 are kept up for each series, it will entail the preparation, in duplicate, of 164 forms for the 82 series, exclusive of form 33 which will be made out in the Divisional Office only. This amount of work is heavy enough; but if the additional forms prescribed by Mr. Fernandez in connection with the plans of operations have also to be kept up, it will entail the further preparation of 18 forms, in duplicate, for each of the 82 series. I maintain that such a large increase of office work will greatly impede the range and sub-range officers in the proper execution of their more important field duties, and when it is considered that the outturn of timber from most of these coupes is of negligible quantity, being under half a cubic foot per acre per annum, I trust you will be inclined to agree with me in thinking that "the game is not worth the candle."

If, however, it is considered necessary to keep up these forms for the regular felling series, on which the larger portion of the timber demand falls (amounting to 1½ cubic feet per acre) I strongly recommend that, for the remaining 69 *nistar* series, it shall be deemed sufficient to keep only one set of forms for the aggregate series of this description comprised in each working-circle or range.

Personally, I should like to see paragraph 107 modified as follows:—

"The prescriptions of the Forest Department Code in regard to the maintenance of control forms 2, 3 and 33 should be strictly observed."

10. Now please read carefully paragraphs 108 to 110 and consider that all the prescriptions contained therein apply to each of the 82 coupes that have to be opened each year in accordance with paragraphs 84 and 85. How is it possible that the large amount of work indicated can be performed, except in a most perfunctory manner, by the small staff at our command, which allows one range officer for every 20 series, and one working-plans inspector for general supervision over the whole 82 series? I have no hesitation in stating my opinion that, if we attempt to put paragraphs 107—110 in practice it will most seriously handicap our field work without greatly increasing our real knowledge of the compartments and their contents—information, moreover, which in regard to the *nistar* areas is not at present of urgent moment. Such a procedure would be justifiable in a valuable teak or sal high timber forest on which the demand is nearly equal to the capability, but cannot, I think, be defended for the poor, open scrub woodlands of the Damoh District. I beg therefore to suggest that the procedure in question be restricted to those coupes only which fall within the regular felling series, numbering 13 only, but which contain the pick of the forest on which the greater part of the trade demand is concentrated. The same procedure should, I think, be considered inapplicable and unnecessary for any of the 69 groups comprising the *nistar* series.

11. In conclusion, I must note that the Divisional Forest Officer has furnished me with a statement showing the receipts for the past 10 years, copy of which I attach, and according to which, I think, it must be confessed that the forecast of revenue compiled by Mr. Fernandez in paragraph 113 of the plan is of far too sanguine a nature. Even after eliminating the figures for 1894-95—1896-97, when the receipts were abnormal, owing to famine, the average revenue for the other seven years amounts to only Rs. 46,018, the maximum revenue in 1891-92 having amounted to Rs. 59,315, and the revenue for the past year having been only Rs. 32,805. Mr. Fernandez, however, estimates a probable revenue of Rs. 66,200, a sum which may perhaps some day be obtained, but is not likely to be realised for many years. Moreover, 10 years ago, certain items of revenue, under grazing and commutation dues, yielded large sums which it is hopeless to expect will be collected in these days of reduced rates and changed procedure; while the large annual sum of Rs. 15,000, which formerly accrued from the sale of lac leases has decreased to less than Rs. 3,000, because of the almost total destruction of this product throughout the forests of the Division.

I think the estimate should be lowered to Rs. 46,000 to agree with the average of the past 10 years, after excluding the three abnormally lean years above mentioned.

The corrections and additions suggested above can, if approved, be made in the plan by printed slips, and would not necessitate the expense of re-printing the plan.

No. 10967, dated the 15th November 1900.

From—J. B. FULLER, Esq., I. C. S., C. I. E., Commissioner, Jubbulpore Division,

To—The Conservator of Forests, Northern Circle, Central Provinces.

I have the honour to forward copy of letter No. 4650, dated the 5th instant, with annexures, from the Deputy Commissioner, Damoh, and to offer the following remarks on the draft working-plan for the forests of this district.

2. I venture to think that the plan is much more elaborate than is justified by the circumstances of the forests or our knowledge of them. The forest growth in Damoh is generally very poor, and indeed the only really good timber I have seen is the teak which grows along the margin of the Bearmi river, all or nearly all of which is private property. There is little or no natural reproduction, nor are we aware of the conditions it requires, though it is not probable that the climate of the district has changed since the existing trees came into being. It is doubtful whether fire-protection in this district conduces to reproduction. It has certainly failed after nearly 30 years' trial in the long-established reserve at Singrampur. Yet it does not seem right to take up the position that we can hardly hope that the forests should renovate themselves, which does not seem an unfair interpretation of the view expressed in paragraph 66. I have from long time past urged the importance of experiments to throw light on the conditions which forest of various classes requires for its renewal by seed and until we know more than we know at present I do not think that we have a basis for rigid rules of forest management. It may be that an occasional fire occurring *early in the season* while the trees are leafless and before they commence to bud or flower followed by a plentiful seeding, and a good monsoon gives the required start to a crop of seedlings. Seed will not germinate or seedlings flourish in dense grass.

3. Taking facts as they are at present the value of the Damoh forests is almost wholly their value as grazing grounds. And they play no small a part in affording good pasturage on well-drained soil to thousands of agricultural cattle which come from outside the district as well as from villages within it. So far as a very large area of the forests is concerned, the growth of wood must in any case be so small that it can be disregarded and our attention be concentrated on the growth of grass. Now as I believe that the growth of grass is greatly improved by firing, I cannot agree to the proposal that the whole of the *nistar* series (paragraph 96) should be fire-protected. I think on the contrary that the Department should see that those portions of it which are grazing areas, pure and simple, are periodically burnt, taking care that they are fired at the proper season.

4. I see moreover that the only fire-protection contemplated for these *nistar* areas is that compatible with the absence of fire guards and even of fire lines and described as of class C. There are serious objections to this system, which solely relies on the fear the people have of prosecution. Fires are not uncommon in areas of this class, and on their occurrence it is generally an object with the forest staff to implicate somebody, though good evidence is rarely forthcoming. And it must be remembered that fire-protection of this class affects the conduct of the public not only inside the forests but on the private lands which adjoin them.

5. I do not quite appreciate the reasons for closing part of the *nistar* areas so as to establish a 5 years' rotation. This seems either to go too far or not far enough, and I should prefer to see these areas left open as at present. It is not so much the restriction of area that I fear as the opportunity which will be afforded for the interference of subordinates. The forest staff is exceedingly small for the area administered, and close supervision will be difficult to secure.

6. I venture then to urge that in the present state of our knowledge we should go no further than to bring under regular working the areas included in the "Regular Felling Series" which cover about a fifth of the total area of the forests. The remaining four-fifths I would leave open to the public as at present, abstaining from a 5 years' rotation (paragraph 72) or from fire-protection till the value of these measures has been established. I would indeed encourage the occasional firing of grazing areas.

7. I think that much can be hoped from the project of sylviculture by the agency of forest villages (paragraph 93).

8. The felling of timber during the rains should not be prohibited unless careful agents prove it to be harmful. In a matter of this sort natives are generally aware of their own interests.

No. 4650, dated Damoh, the 5th November 1900.

From—W. N. Maw, Esq., I. C. S., Deputy Commissioner, Damoh,

To—The Commissioner, Jubbulpore Division.

I have the honour to enclose a copy of letter No. 6815, dated the 3rd September 1900, from the Conservator of Forests, and as requested therein to forward the working-plan which has been drawn up for the forests of the Damoh Division, together with my remarks.

2. The necessity for a working-plan is a point on which I presume it is unnecessary to touch. The present working-plan has been prepared so that no one may be obliged to go more than 4 miles for his wood and grass and no village requiring grazing to drive the cattle out beyond that distance. I would remark that if grass is available nearer a village, the villagers would be put to unnecessary inconvenience in having to drive their cattle 4 miles away every day. But only 11,291 acres and the areas enumerated in paragraph 89 of the working-plan will be closed to grazing, and the minimum area open to grazing will be 453,535 acres. The provision for grazing will therefore probably be ample.

3. Arrangements are to be made for the formation of a forest village (*vide* paragraph 100). I will inspect the site in the cold weather on my march from Lanji Imalia to Balakote.

4. It is not mentioned (so far as I can see) as to whether the cutting of timber in the coupes is to be allowed during the rains or not.

5. The plan prescribes the maintenance of double control books. One set is prescribed in the Forest Department Code and the other in the form prescribed by the working-plan (*vide* paragraph 107). This will entail a great increase in office work, which is already very heavy and may hamper the due inspection of the forests.

Secretariat Press, Nagpur :—T. P. R., 1-8-1901—75.

Addenda and Corrigenda to the Working-Plan for the Forests of the Damoh Division.

Nagpur, the 25th June 1901.

1. Paragraph 72 on page 16—

Delete that portion of paragraph 72 beginning with the words "but a short" in the 2nd line, and ending with "at all" in the last line.

2. Paragraph 73—

For the words "split up into working divisions, which" in lines 4 and 5, *substitute* "clubbed together in each Working Circle under one series"; and for the word "series" in line 6 *read* "areas," and *delete* the words "of series" in the same line.

In the statement appended to this paragraph, *delete* columns 7 and 8 headed respectively "Characteristic letter" and "Serial number."

3. Paragraph 76—

Delete the portion beginning with the words "and 85 below" in line 2 and ending with "coupe" in line 3, and *insert* the following :—

"When however the demand for poles is in excess of the demand for fuel, the coupe of the year in advance may be indented on, within the limits provided for in the felling table of paragraph 84."

4. Paragraph 79—

For "coupes" in the 1st line *read* "blocks."

5. Paragraphs 81 and 82—

For the word "series" wherever occurring in these paragraphs, *read* "areas."

6. Paragraph 85—

Substitute the following *for* this paragraph and the table appended to it—

"The nistar areas will, as a whole, be kept permanently open for grazing and the removal of nistar produce in accordance with the limitation of rules prescribed in paragraphs 79, 81, 82, and 89."

7. Paragraph 90—

In the table appended to this paragraph *for* "series" in column 3 *read* "areas."

8. Paragraph 96—

Delete the last sentence beginning with the words "When ten years" in line 9, and *insert* the following :—

"But there will be no objection to certain of these latter areas being fired under the supervision and orders of the officers of the Department. The kind of protection contemplated cannot be thoroughly effective, and the protection of lac-producing areas will doubtless be rendered more certain by deliberately burning under control the grass on the adjacent lands."

9. Paragraph 107—

Delete the sentence beginning with "These details" in line 5 and ending with "plan of operations forms" in the next line.

10. Paragraph 111—

Substitute the following *for* this paragraph :—

"It is impossible to foretell when a revision of the present plan will become necessary; it is, however, right to say that unless a radical change of procedure is called for, it will suffice to insert in their proper places the few alterations or additions that may from time to time become imperative. Should it be found that a Regular Series is unworkable, it will be at once removed from the Regular to the Nistar list. On the other hand should the demand for wood on a Nistar area increase sufficiently to allow of its regular working, there will be no difficulty in transferring it from Nistar to the Regular Series list and splitting up its area into 20 or 30 coupes according to the grazing pressure to be met."

H. A. CRUMP,

Chief Secretary to the Chief Commissioner,

Central Provinces.

Secretariat Press, Nagpur :—T. P. R., 26-6-1901—100.

WORKING PLAN

FOR THE FORESTS OF THE

DAMOH FOREST DIVISION,

NORTHERN CIRCLE, CENTRAL PROVINCES,

FOR THE PERIOD

1899-1900 to 1928-29.

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PREFACE.

THE preparation of working plans for the forests of the Damoh Division was first taken in hand in 1894 by a Ranger, styled Working Plans Assistant, under the direct orders of the Conservator. These working plans were each for small areas selected here and there, where a demand was expected. After a year's trial they were replaced by plans each framed for separate ranges, but, like the original plans for the forests of the Hoshangabad, Narsinghpur, Jubbulpore and Betul Divisions, these were based on principles which were not found quite practical. Accordingly, in January 1898, I decided to undertake, with the help of the Working Plans Assistant, to draw up a single plan for the entire Division. While the work was in progress, Mr. Hole, Assistant Conservator, who had been on special duty with me for the preparation of working plans, was fortunately posted to the charge of the Division in September of the same year, and I at once made it over to him. He knew all my ideas on the subject and his daily contact with the forests was a guarantee that no local conditions or requirements would be overlooked. The rough draft was ready by the following November and the plan was at once put into execution as the best test to which it could be subjected before submission for sanction. The result of one season's experience (1898-99) established its practical character. It would have had the benefit of yet another season (1899-1900) of trial, had not the present famine unfortunately intervened to keep its provisions in abeyance owing to the free forest concessions granted to the starving labouring classes and to the straitened circumstances and consequent greatly reduced purchasing capacity of the people of the Damoh and surrounding districts. This circumstance need not, however, delay the submission of the plan, for the demand on the forests for wood is even in normal times so limited, that it is certain that a second year of trial would not affect the general frame-work of the plan. Mr. Hole, who had in the meantime been transferred to the charge of another Division, was good enough, in spite of his heavy current duties, to collaborate with me in preparing the final draft for publication and Part I, except for a little *editing*, is his share of the work.

CAMP NARSINGHPUR :
The 11*th May* 1900.

E. E. FERNANDEZ,
Conservator of Forests,
Northern Circle, Central Provinces.

PART I.

SUMMARY OF FACTS ON WHICH THE PROPOSALS ARE BASED.

CHAPTER I.—Description of the Tract dealt with.

Article 1.—*Name and Situation.*

This report deals with the forests of the Damoh Division. These comprise all the forests of the Damoh district of the Jubbulpore Commissionership, with the exception of 9,800 acres situated in the extreme south-west corner of the district, which is administered as a part of the Narsinghpur Division. The Damoh Division is thus bounded :—

North.—The Panna, Bijawar and Chhatarpur States.

South.—The Saugor, Narsinghpur and Jubbulpore Divisions.

East.—The Panna State and Jubbulpore Division.

West.—The Saugor Division.

2. The Government forests are situated principally in the northern and southern hilly portions of the district, the central tract being largely alluvial and consequently highly cultivated. The Division is divided into four ranges, *viz.*, the Northern, Central, South-Western and South-Eastern ranges.

Article 2.—*Configuration of the Ground.*

3. We are here on the water-shed of the Ganges and the Nerbudda systems, but by far the larger portion of the area lies in the valley of the former river, its drainage being carried by the Bearmi into the Jumna, while only that of the outer slopes of the Vindhyan plateau on the south and south-east goes into the Nerbudda. The southern half of the district is rugged and hilly; then comes the alluvial belt already mentioned, about 20 miles wide, the entire length of which is traversed by the Sonar, an affluent of the Bearmi, which it joins at the north-eastern corner of the district. Finally this plain is closed in on the north by a line of hills which run along the northern boundary of the district.

4. It is in these two hilly tracts that all the forests of the Division are situated, with the single exception of Block 19, which lies outside in the alluvial plain.

5. The northern hilly tract consists of a plateau stretching between the Semri Naddi on the north and the Sonar river on the south. The northern slopes are indented by deep and precipitous gorges at the bottom of which flow the Semri and its affluents, while on the south the plateau slopes down gently towards the Sonar plain.

6. The southern hilly tract comprises the great plateau of the Upper Bhander rocks, which stretches with only one interruption from a line drawn through Damoh and Patera in the north to the rich alluvial plain of the Nerbudda in the Jubbulpore and Narsinghpur districts in the south, the northern slopes being generally precipitous. The interruption mentioned above is that caused by the peculiar alluvial plain in the north of the south-eastern range, in which Jabera and Singrampur are situated, its central portion being occupied by the Amghat hill. The eastern portion of this plain is drained by the Phulku river into the Hiran, a tributary of the Nerbudda, and the western by the Bhadar river into the Goraiya, a tributary of the Bearmi. The southern portion of the pleateau, on which most of the forests of the south-western and south-eastern ranges are situated, is flat or gently undulating, the rocky table-land being interrupted only by the steep ravines and narrow valleys cut by the Bearmi and its numerous tributaries, the principal of which are here the Berma, Goraiya and Bhadar. Towards the north, in the area composing the central range and the northern portion of the south-eastern range, the plateau becomes much cut up and interrupted, and large areas of undulating alluvial ground separate the irregular masses of flat-topped hills, which, sloping gently towards the surrounding plain, are themselves intersected in all directions by deep ravines and gorges.

7. The elevation above the sea is as shown below for each range separately:—

Range.	Maximum.	Minimum.	Mean.	Remarks.
	Height above the sea in feet.			
Northern	1,754	1,047	1,436	The differences of level are thus of no practical importance from a forest point of view.
Central	1,993	1,000	1,347	
South-Western	1,862	1,100	1,426	
South-Eastern	2,461	1,119	1,584	

ARTICLE 3.—*Underlying Rock and Soil.*

8. We are here situated on the western extremity of the long arm of the Vindhyan basin which extends for 340 miles, with a maximum width of 50 miles, from Saugor on the west to Sasseram in Behar on the east. The rocks of the lower Vindhyans are only visible in the gorges of the Berani Naddi and of its tributaries in the extreme north of the area occupied by the upper or true Vindhyans. For the purpose of geological description, the area of the Damoh district in which the forests of this Division are situated may be conveniently divided into three portions as follows :—

I. The area lying north of a line drawn from Pondi on the east to Khundairi on the west and including the forests of the Northern Range.—This is again conveniently subdivided by a line drawn from Ghogra on the east to Bari Kanora on the west. In the tract lying to the north of this line Kaimor sandstone and conglomerate are the prevailing rocks, lower Vindhyan sandstones and limestones appearing in the valleys of the Berani Naddi and of its tributaries. Ferruginous bands are seen in the Kaimor rocks near Ghogra, presumably similar to the deposits which are worked for iron by the inhabitants of Kupi and the neighbouring villages in native territory. South of the above line Upper Rewah sandstone predominates, the Kaimor rocks covering only a small area along the boundary of the district between Rampura and Semarkachhar. Trap occupies small areas near Sadpur, Khutiyani and Dalpatpura and the Lametas (infra-trappean) surround the trap of Bia-Bareri hill.

II. The area lying south of a line drawn from Patera on the east to Dhangor on the west and including all the forests of the Central, South-Western and South-Eastern Ranges, with the one exception of Block 19, Umraho Jamunia.—Here the prevailing rock is Upper Bhander sandstone. Sirbu shales are frequently found occupying small areas in the valleys and on the lower slopes, especially in the central range, and in the neighbourhood of Singorgarh in the south-eastern range. Trap occurs at Jamunia and Kotatala in the central range, near Tindni in the south-western range and at Kulumar in the south-eastern range. Lametas also appear at the last place in company with trap. At Amghat hill in the south-eastern range a complicated assemblage of rocks is met with. The central plateau consists of Upper Rewah sandstone, the outer slopes being occupied successively by Ganurgarh shales, Bhander limestone, Lower Bhander sandstone and Sirbu shales.

III. The alluvial belt lying between tracts I and II.—Containing, as it does, only one small forest Block No. 19, it needs but a brief description. It will suffice to say that a variety of geological formations, including Trap, Lametas, Sirbu shales, Lower Bhander sandstone, Bhander limestone and Ganurgarh shales, occasionally crop out among the alluvial deposits which, however, occupy by far the greater portion of the area and that the principal formations within the forest area at Umraho-Jamunia are Trap and Lametas.

9. A brief description will now be given of the principal rocks, which have been mentioned above.

Throughout the Trap area the prevailing rock is as usual some form of dolerite or basalt, and it is generally to be recognised by the occurrence of amygdaloidal basalt with glauconite (green earth) or of porphyry containing large tabular crystals of glassy felspar, white or green in colour.

The Lametas consist of limestones, sandstones and clays. The limestone is usually rather a calcareous grit, containing an abundance of nodules of segregated chert, some of the small pebbles frequently consisting of red jasper. The sandstone is usually fine-grained, porous and earthy in character and of a greenish colour. The clays are red or green, and are very frequently sandy or marly.

We now come to the Vindhyan rocks, which cover by far the greater part of the area. The Kaimor conglomerate is everywhere conspicuous through the prominence in it of bright-red jasper pebbles. Regarding the principal sandstones there are general characteristics peculiar to each. The Kaimor rock is fine-grained, greyish, yellowish or reddish-white, sometimes speckled brown. False bedding is frequent and massive beds are abundant; but, on the whole, the bedding is of moderate thickness, becoming sometimes flaggy and even shaly.

The Rewah sandstone is somewhat coarser, and generally presents a mixture of massive strata and false-bedded flags. The Bhander sandstone is softer than that of the lower bands, very fine-grained and generally distinguishable by its deep red or purple tint with white specks and blotches. It is also frequently pale to white in colour, with or without red streaks, and occasionally of a dull-greyish pink with darker streaks. The beds are generally thinner and not more than 6—18 inches in thickness, but massive beds also occur. Ripple-marking is common throughout the greater part of the Vindhyans, and occurs in great profusion and variety in the Upper Bhanders. The Sirbu and Garurgarh shales do not present any constant distinctive characters. Their sharply-bedded, flaggy, silicious or sandy, sometimes micaceous, shales of greenish and rusty tints form the prevailing type throughout. The Bhander limestone is the most variable rock of the series. Sometimes there is a considerable thickness of firm stone, elsewhere there is very much less, the carbonate of lime being apparently disseminated amongst the calcareous shales associated with the limestone and partly taking its place. The limestone is generally earthy and compact with grey, yellow or reddish tints ; sometimes purer, and either compact or crystalline.

10. The soil derived from these rocks is shallow, stony and barren, and owing to the general uniformity of the geological formation is practically identical throughout as regards mineral composition and physical properties, being a loam in which sand is usually largely in excess, save where modified by an admixture of disintegrated trap. Here and there pockets of rich black soil are found and in the valleys and gorges small areas of alluvial deposits. Hardly less important than the soil itself, however, as influencing the character of the forest with respect to admixture of species and development of individual trees, is the nature of the subsoil. Here as elsewhere, the Vindhyan beds lie little disturbed and the underlying rock is generally found in enormous slabs and sheets which are almost horizontal. Drainage conditions are therefore interfered with, and where this occurs, the admixture of species and the growth of individual trees differs considerably from that found on slopes and undulating ground, where the underlying rock is somewhat broken up and better drainage conditions prevail.

ARTICLE 4.—*Climate.*

11. A good general idea of the climate of the Division will be obtained from the following meteorological figures :—

Rainfall at nine Stations situated inside and just outside the Division. (*Average of seven years from* 1892 *to* 1899.)

District.	Rain-gauge station.	Average annual rainfall.	Maximum annual rainfall.	Minimum annual rainfall.
Damoh	Damoh	51·11	65·07	34·19
	Hatta	51·66	59·17	38·70
	Tejgarh	42·90	50·75	29·85
Jubbulpore	Jubbulpore	62·56	76·21	50·83
	Sihora	52·64	71·87	37·32
Narsinghpur	Narsinghpur	50·49	74·61	28·52
	Gadarwara	54·47	70·27	30·64
Saugor	Rehli	39·31	60·70	15·00
	Banda	39·66	52·48	28·09

The average annual rainfall of the Division may thus be taken to be about 49 inches.

Temperature (*no data available for Damoh district*). (*Average of seven years from* 1892 *to* 1899.)

District.	Highest temperature registered in shade.	Lowest temperature registered in shade.	Mean temperature registered in shade.
Saugor	110·7	43·6	76·91
Jubbulpore	111·1	38·3	76·52

For the Division itself a mean between the above figures may be assumed.

12. The rains last usually from the middle of June to the early part of October, and there are occasional showers in the cold weather. Night frost is frequent in December and January. On the whole, the climate of the Division may be characterised as moderate and healthy.

ARTICLE 5.—*Agricultural Customs and Wants of the Population.*

13. The population is essentially agricultural and mainly of Aryan stock, but within and in the immediate neighbourhood of the forests aboriginal races, chiefly Gonds, are largely represented and in some villages predominate.

14. More than two-thirds of the district consisting of hilly country covered with forest where only a bare subsistence can be earned by the cultivation here and there of inferior crops, the inhabitants are generally poor and their dwellings consequently roughly constructed and of simple design. Owing to the excellent building material afforded by the Vindhyan sandstone almost everywhere available, all dwellings, except those of the poorest classes of inhabitants, are constructed of stone. They may be classified under three main types as follows—(1) those belonging to landlords in the rich alluvial tracts and to members of the trading and literary classes; (2) those inhabited by landlords in the poor upland regions, artisans and petty cultivators; and (3) those occupied by aboriginals and the poorest classes of people.

15. The first type consists of a main, often two-storied block, forming one side of a quadrangle, the other three sides being closed in by living rooms, granaries and stabling. The walls are of masonry, built up inside a timber frame-work and the front of the building often consists of an open verandah supported on carved teak posts. The entrance to the courtyard is through the front block and is closed with massive iron-bound wooden doors. The building is roofed with tiles laid on split bamboos resting on sawn rafters. The woods used are principally teak, saj, jamun and haldu. This type is entirely confined to the small towns and largest and most prosperous villages.

16. The second type of house is never two-storied and the masonry walls have little or no timber frame-work. As before, the main block frequently forms one side of a quadrangle, the other three sides consisting of an enclosing wall in which is the small door giving access to the courtyard. Occasionally a few sheds are erected for stabling on one or more sides of the quadrangle, but more frequently the cattle are kept in the courtyard. The latter is also in many cases enclosed by a simple dead-thorn fence or a stout wooden railing. Every house has a gaily painted open verandah supported on wooden posts and generally has a small garden attached. The building is roofed with tiles laid on split bamboos resting on round rafters. Teak is not often used in these houses.

17. In the third type stone is very rarely used and the walls consist of wattling plastered over with a mixture of mud and cowdung. Inside the walls stout forked posts are fixed at intervals of about 6 feet and on these rest the long poles supporting the roof. The roof consists occasionally of tiles, but more frequently of thatch and is laid over *siharu* or *ningori* branches spread flat over a light trellis of bamboos or of small wood of inferior species, which is supported by round rafters. The wood used is almost invariably of inferior species, *dhawa* being most frequently employed.

18. The produce thus required by the agricultural population consists chiefly of small timber for building purposes, wood and thorns for fencing the cattle pens and threshing-floors, small wood and bamboos for the shelters and *machans* required by the villagers deputed to watch the crops, grass for thatching, chheula root for the fibre universally employed for all purposes instead of rope or string, wood for carts and agricultural implements, the most important of the latter being the *narri* or combined plough and drill and the *bakkhar* or bullock-hoe.

19. The forests of this Division have always been favourite grazing grounds, both for the cattle of the villages of the district and of those situated in the *havelis* of the adjoining districts of Jubbulpore, Narsinghpur and Saugor. Cattle belonging to villages surrounded by or adjoining Government forest resort to it daily throughout the year. The inhabitants of the more distant haveli villages send their cattle to the villages in the upland forest tracts to graze at the commencement of the rains, the graziers taking up their abode either in the immediate vicinity of a village or in the forest itself. They erect temporary shelters for themselves and the enclosures constructed for the cattle are termed *khonras*. Several cultivators frequently accompany these herds and they sow and reap a kharif crop in the villages where they have taken up their temporary residence. When water gets scarce in the dry hilly tracts towards the end of October or beginning of November these herds are taken back to their villages in the haveli.

20. At the time of harvesting the kharif and rabi crops the inhabitants of the hilly forest tracts flock to the neighbouring haveli, to obtain a store of grain as wages for their labour in the fields. This, added to the produce of their own scanty crops, forms their annual supply of food-grain, which, eked out with mahua, achar, tendu and other edible forest products, affords them sustenance throughout the year.

21. A considerable proportion of the labouring population find employment during certain periods of the year, when no agricultural operations are in progress, in cutting and

collecting lac and propagating it and collecting other minor forest produce for the Government lessees. The crude lac obtained and much of the other produce is exported, principally to Bombay *viâ* Jubbulpore.

22. Agriculture is supplemented by other minor industries carried out on a small scale, which are of interest from a forest point of view, such as lime-burning, katha manufacture and iron-smelting.

23. Lime-burning is carried out principally in the neighbourhood of Damoh, where the kankar beds underlying the black cotton soil have been worked for lime for many years. The kankar is burnt in primitive circular kilns of about 10—12 feet diameter and 7 feet deep, dug in the ground and lined with clods, the kiln being surrounded by a protecting wall of clods about 2½ feet high. Altogether about 600 cubic feet of kankar is put into one kiln, which is burnt in a period varying from 15 days to one month, producing 360 maunds of lime and requiring about 300 maunds of fuel, green wood being preferred for the purpose.

24. Katha manufacturers (*Khairwas*) belong to the poorest classes of inhabitants and are Gonds by race. Many of these people belong to the district, but in the north they principally come from the adjoining native States. These small communities of khairwas make temporary huts for themselves and settle either in or in the immediate vicinity of the forest where there is a sufficient supply of khair trees available suitable for their purpose. Here they remain for the working season of five to six months in the cold and hot weather. From an experiment made, it has been calculated that on an average a khair tree of from 9 to 18 inches girth and 10 feet in length yields about 2 chhataks of katha and that one man can manufacture 10 seers in a month.

25. Iron-smelting is at present only carried out on a very small scale by a few *lohars* in outlying villages in the north of the district adjoining native territory.

CHAPTER II.—Composition and Condition of the Forests.

Article 1.—*Distribution and Area.*

26. The following statement, which is illustrated by the accompanying trace on the scale of 1 inch = 2 miles, gives by classes the names and acreages of the various blocks and their distribution among the several ranges and sub-ranges. The signification of the classes is explained in paras. 28 and 29 below :—

Range.	Sub-range.	Block.		Acreage under class				Total acreage.
		Serial No.	Name.	A.	B-II.	B-I.	Un-classed.	
Northern ...	Batiagarh ...	1	Panchamnagar ...	...	2,445	...	...	2,445
		2	Saonrai ...	...	6,021	...	...	6,021
		3	Hathidol ...	...	15,436	372	...	15,808
		4	Ghorakhuri ...	...	4,794	...	...	4,794
		5	Sukri ...	...	4,675	292	...	4,967
	Fatehpur ...	6	Naipar ...	...	5,142	1,144	912	7,198
		7	Silapri ...	...	7,257	...	...	7,257
		8	Manakpura ...	...	5,095	...	...	5,095
		10	Kanora ...	...	893	...	...	893
		11	Bhainsdoh ...	...	3,370	...	...	3,370
		12	Bari Kanora ...	...	3,322	...	...	3,322
		13	Chaopara ...	...	5,687	168	...	5,855
		14	Karkohi (part) ...	...	14,782	...	...	14,782
		15	Bharkhura (part) ...	...	2,513	...	...	2,513
	Mariadoh ...	9	Chaoraiya ...	...	8,224	...	...	8,224
		14	Karkohi (part) ...	...	117	...	...	117
		15	Bharkhura (part) ...	...	14,600	...	...	14,600
		16	Mariadoh ...	...	219	...	...	219
		17	Karibara ...	...	6,272	...	...	6,272
		18	Bardha ...	...	7,359	...	...	7,359
			Total ...	...	118,223	1,976	912	121,111

Range.	Sub-range.	Block.		Acreage under class				Total acreage.
		Serial No.	Name.	A.	B-II.	B-I.	Unclassed.	
Central ...	Damoh ...	19	Umraho Jamunia ...	...	2,106	...	...	2,106
		36	Khamkhera ...	...	4,171	...	...	4,171
		37	Damoh ...	...	1,335	...	...	1,335
		38	Rajnagar ...	...	6,724	...	...	6,724
		39	Kulua ...	...	226	...	...	226
	Kumhari ...	20	Mahuadanda ...	...	2,599	...	...	2,599
		21	Magra ...	...	11,275	...	...	11,275
		22	Hathibar ...	...	891	...	...	891
		23	Barrat ...	...	1,165	...	...	1,165
		24	Zer ...	...	6,741	...	...	6,741
		25	Kuakho ...	...	191	...	...	191
		26	Piparia Mul ...	...	781	...	...	781
		27	Gudri ...	...	2,349	...	...	2,349
		28	Padri ...	...	3,230	...	...	3,230
		29	Baraiyakhera ...	...	5,107	...	...	5,107
		30	Pando ...	...	1,234	...	...	1,234
		31	Maria ...	...	6,784	...	...	6,784
		32	Garaghat ...	...	991	...	...	991
		33	Golapatti ...	...	358	...	...	358
		34	Pateriya ...	...	1,476	...	...	1,476
		35	Kusmi ...	...	...	...	462	462
	Balakot ...	40	Amata ...	...	815	...	...	815
		41	Jamunia ...	...	3,844	...	...	3,844
		42	Balakot ...	...	11,507	...	...	11,507
		43	Bahera ...	...	9,088	...	...	9,088
		44	Chirai ...	...	7,968	...	...	7,968
		45	Dhaba ...	...	1,453	...	...	1,453
		46	Somkhera ...	...	5,566	...	...	5,566
		47	Jamunhatri ...	...	6,201	...	...	6,201
			Total ...	...	106,176	...	462	106,638
South-Western ...	Tejgarh ...	48	Dasondi ...	...	...	...	292	292
		49	Bhainskhar ...	...	...	...	274	274
		50	Parasai ...	...	2,641	...	...	2,641
		51	Bandopahar ...	...	...	...	163	163
		52	Pateriya ...	...	6,052	...	...	6,052
		53	Hardua Hathighat	...	...	...	777	777
		54	Mohar ...	...	8,727	...	...	8,727
		55	Sanga ...	...	9,559	181	...	9,740
		56	Jhalon ...	...	522	...	...	522
		57	Sehri ...	...	915	...	...	915
		58	Kuakheri ...	...	939	...	...	939
		59	Aonria ...	...	3,763	...	...	3,763
		60	Lorhi ...	...	8,030	...	2,738	10,768
		61	Baheria (part) ...	...	3,878	...	...	3,878
		62	Bagdari ...	...	8,587	...	...	8,587

Range.	Sub-range.	Block.		Acreage under class				Total acreage.
		Serial No.	Name.	A.	B-II.	B-I.	Un-classed.	
South-Western—(*concld.*)	Zerghati ...	61	Baheria (part) ...	...	4,290	...	1,138	5,428
		63	Hathidol ...	...	6,394	...	...	6,394
		64	Hanmatbago ...	...	10,764	...	...	10,764
		65	Gopalpur ...	...	...	...	718	718
		66	Jamun ...	...	10,951	...	...	10,951
		67	Palwa ...	...	9,943	...	...	9,943
		68	Deori ...	...	13,162	...	...	13,162
		69	Barbota ...	...	330	...	...	330
	Taradehi ...	70	Sarratura ...	...	3,977	...	...	3,977
		71	Kaliakuhi ...	...	9,879	...	...	9,879
		72	Bikrampur ...	...	1,186	...	...	1,186
		73	Dhakarwaho ...	...	9,158	...	...	9,158
		74	Lagra ...	...	10,003	...	...	10,003
		75	Dudhia ...	...	13,736	...	...	13,736
		76	Jamunjhri ...	...	13,521	...	...	13,521
		77	Phular ...	...	721	...	...	721
			Total ...	...	171,628	181	6,100	177,909
South-Eastern ...	Singrampur ...	78	Deotara ...	...	7,807	...	...	7,807
		79	Jhada ...	...	3,610	...	...	3,610
		80	Kheri ...	...	4,647	...	...	4,647
		81	Konda Kalan ...	...	1,619	...	...	1,619
		82	Churiari ...	...	6,585	...	...	6,585
		84	Singrampur ...	6,458	...	...	...	6,458
		85	Deori (part) ...	...	1,296	...	...	1,296
	Sailwara ...	83	Bansipur ...	...	1,075	...	...	1,075
		85	Deori (part) ...	...	2,328	...	...	2,328
		86	Saonra ...	...	116	...	...	116
		87	Aloni ...	...	6,603	...	...	6,603
		88	Bhaonrpani ...	...	8,922	...	...	8,922
		89	Gidra ...	...	9,352	...	...	9,352
		90	Nibhora ...	...	429	...	...	429
		91	Hinoti ...	...	9,570	...	...	9,570
		92	Sainpura ...	...	677	...	...	677
		93	Tola ...	...	7,015	...	...	7,015
		94	Silpura ...	...	5,864	...	...	5,864
		95	Mehgawan ...	...	5,235	...	...	5,235
		96	Sahajpur ...	...	11,405	...	...	11,405
			Total ...	6,458	94,155	...	...	100,613

Abstract of preceding Statement.

		Acres.	Acres.	Acres.	Acres.
Northern Range	...	118,223	1,976	912	121,111
Central "	...	106,176	...	462	106,638
South-Western Range	...	171,628	181	6,100	177,909
South-Eastern "	6,458	94,155	...	...	100,613
Total Division ...	6,458	490,182	2,157	7,474	506,271

ARTICLE 2.—*State of the Boundaries.*

27. Where the limits of the forests are not defined by watercourses, they are demarcated by means of cleared lines 40 feet wide, set out at all angles with stone cairns about 5 feet high, in the centre of each of which is fixed a wooden post bearing the proper consecutive number. From every mark, the nearest one on either side is clearly visible. Many of these cairns are in bad repair and the posts in most cases decayed. The boundary lines are cleared every year.

In the Singrampur Reserve and on a part of the boundary of the Mugra Forest (Central Range), the stone cairns are replaced by round masonry pillars about 4½ feet high.

ARTICLE 3.—*Legal Position of the Forests.*

28. All the forests of classes A, B-I and B-II have been reserved under Section 34 of the Indian Forest Act of 1878 by Chief Commissioner's Notification No. 886 published in the *Central Provinces Gazette* of 20th February 1879. There is thus absolutely no distinction between them so far as their legal position is concerned. By class A is meant that the forests comprised thereunder are intended to be permanently maintained as State forests. Under B-I are included all those areas which, having been found suitable for cultivation in B-II class Reserves, have accordingly been excised and placed under the Land Revenue Department for ryotwari settlement, although they have still to be formally disforested. Thus class B-II at last actually includes only such areas as have been found unsuitable for cultivation and which should therefore now be transferred to class A. Proposals for such transfer are already before the Administration.

29. The unclassed areas comprise certain superfluous Government waste lands which not being required by the Land Revenue Department, have been handed over for management to the Forest Department and will ere long, if found suitable, be settled as Reserved Forests under Chapter II of the Indian Forests Act, 1878.

ARTICLE 4.—*Rights.*

30. No rights or concessions of any kind burden these forests.

ARTICLE 5.—*Composition and Condition of the Crop.*

31. Owing to the generally uniform character of the rock and soil found throughout the forests of this Division, as noted in para. 10 above, there is, as might be expected, only one marked type of forest, that characteristic of the dry hill forests of Central India. Owing to slight differences in the depth of soil, in the amount of moisture contained in the soil or in the character of the sub-soil, certain species predominate over small local areas, but in no case is the difference so marked or area so large as to justify the classification of such forests as distinct sylvicultural types.

32. At the commencement of the cold season, towards the end of November, a casual observer, travelling through these forests and looking from a distance at a range of forest-clad hills, could scarcely fail to be struck with the fact, that the growth seems to be divided into three definite zones or belts. Along the valley and stretching a short distance up the hillside is a belt of fresh dark-green; this is divided by a sharp line from the zone which occupies the middle slopes, the prevailing colours there being fresh browns, russet reds and yellows, while these again fade away more gradually into the uppermost belt occupying the highest slopes and plateaux, which is characterised by dull yellows, greys and neutral tints.

33. On a closer inspection the lowest dark-green belt is found to occupy the moist deep soil on the banks of a watercourse and in its immediate neighbourhood. The undergrowth is a tangled mass of shrubs and climbers, the green makor, karonda, rori, kat-umar and kau bushes, with the great plate-like leaves of mahol and the climbing rámdatón and bhaonria-chheula being most noticeable. Above these stretch the umbrageous crowns of fine saj, mahua, koha, umar and gurar trees, while further from the stream, the dark-green of khair, fresh light green of bhira and the foliage of numerous other trees all combine to form this zone of many tinted greens. Only here and there is a yellowing gunja leaf or the red foliage of kenkra to be seen, and only occasionally do the deep orange red leaves of khatua or the dark crimson of the young shoots of kumbhi or of banda (*Loranthus*) vary the prevailing tint.

34. Passing further up the hillside into the middle zone, one sees that the leaves of teak and seji have become brown, of dhawa a dull red, of kari a greenish yellow, of dudhi, bhira, ghont, aonla, bahera, makor and others a light yellow. Many trees have already partly shed their leaves and only occasionally is the green foliage of saj, achar, tendu or other trees to be seen, the dull grey green of the small leaves of which is in marked contrast with the fresh-colour of the luxuriant foliage seen in the valley below.

35. Gradually, as one ascends further, the soil becomes more shallow and rocky, the trees are more scattered, nearly all the leaves of deciduous trees have fallen and the most marked features are the silvery stems of kulu, the bare branches of salai, gunja, gabdi, harua and semal, the stunted khair, some dead, others stag-headed and dying, the short and scanty grass and the dark rocks. Yet here, as in the moist valley below, almost all the principal species occurring in these forests are to be seen. On the top of the hill above, however, they are stunted and deformed, whereas below they are of good development; above, the deciduous trees are bare of leaves, below, their foliage is still green; above, the leaves are small and of a dull grey green, below, they are large and of a full fresh green.

36. All these facts would be far more remarkable to the casual observer than would any difference in the actual admixture of species composing the forest growth, from which it is natural to infer that a classification of the crop based on the character of the soil would be more correct and more likely to give an accurate description of the forests than one based only on the difference in the admixture of species.

37. Following this idea the forests of this Division may be best described under the three types given below:—

Type I. *Found on soil of medium depth.*—This is taken first, as it includes a large proportion of the forests of this Division, and also because it may be regarded as the original type from which the others have been derived. It stretches chiefly over the middle slopes and over the undulating ground found in the broad valleys so frequently met with at the higher elevations in these Vindhyan hills. The soil here is frequently only a few inches in depth, but the underlying rock being broken up, a permeable sub-soil and good drainage conditions compensate to a great extent for the shallowness of the soil proper. In such situations the struggle for existence is usually not so severe as to eliminate any one species entirely, the conditions of the locality not favouring in a marked degree the development of any one species more than another, and consequently almost all the species mentioned in Appendix II are found in this type. The growth, as is to be expected, is usually inferior, the average height seldom exceeding 50 feet. Reproduction is fairly easily obtained wherever grazing is moderate. Good growth of teak and, especially in the northern range, of khair on favourable slopes is frequently seen in bharkas or small ravines, and in similar places a dense growth of bamboos is often common. Bhira occasionally occurs pure over small areas, especially in the south-western range. All degrees of density are represented and very slight variations in the soil or sub-soil suffice to bring about a marked change in the character of the crop, the type then passing almost insensibly into Type II, on the one hand, and into Type III, on the other.

Type II. *Found on deep soil.*—The most valuable forests of this Division, including the old ramnas of Mariadoh, Singhpur, Baraiyakhera, Nimkhera, Tindni, Phular, Sehri, Gopalpur, Singrampur (portions) and Bansipur belong to this type. In it the prevalence of the better species is very marked, especially of teak, saj, tinas, dhawa, seji and bija, these being here able to oust such species as gunja, salai, kulu, gabdi, harua and thuar, or at all events to materially diminish their numbers. When the forest has not been much interfered with, it is generally dense and of good growth, the average height being about 60 feet. Reproduction is usually good, except in the open areas, where it is choked out by a dense growth of grass or cut back by frost. Teak attains its best dimensions in this type. Trees of 55—75 feet in height are fairly frequent in the ramnas of Phular, Gopalpur and Bansipur, with a girth of 2—4 feet measured at 3½ feet from the ground and with clean straight boles of from 20 to 30 feet. Excellent pole woods of teak are seen in the Singrampur ramna near the Jubbulpore-Damoh road. In the Tindni ramna, tinas occurs in dense groups, practically pure except for a few teak, over an area formerly cultivated, attaining a height of 30—40 feet. Elsewhere the proportion of teak is greater, as in the case of the Phular ramna. Here the tinas consists largely of suppressed growth and is generally crooked. It forms good groups, however, in the more open patches, trees 44—47 feet in height being found with girths of 18—20 inches measured at 3½ feet from the ground. Several excellent saj are also found mixed with the teak, a tree measured in the Phular ramna giving a height of 58 feet with a clean straight bole 27 feet long and a girth of 3¼ feet. When the proportion of clay in the soil increases and a binding loam is produced, the number of teak diminishes and the growth of such as are found is inferior, the trees being usually short, crooked and much-branched, although frequently of large girth. In such places saj, dhawa, mahua, achar and seji predominate and attain their best growth, while good bija and bahera are frequently met with. These areas have generally at some time or other been under cultivation and the growth is therefore usually open, groups of trees alternating with large open patches which are covered with a heavy growth of grass. Such areas are particularly adapted for the cultural operations prescribed in paras. 92—94 below. Numerous pockets of rich black soil occur, which are not suited for the successful cultivation of valuable forest trees, although eminently

adapted for that of field crops. At present such areas usually bear a scanty growth of chheula, stunted saj, seji and aonla, mixed with ber, karonda, makor, ghont, chhind and other shrubs, standing out of dense masses of coarse grass. Such tracts would be profitably included within the limits of Forest villages, as provided for in para. 100 below.

TYPE III. *Found on shallow, rocky soil.*—This type is confined to the upper slopes and tops of hills. The underlying rock is frequently exposed on the surface and elsewhere a thin growth of grass covers the ground. The crop is invariably stunted and open and consists largely of shrubs. Kulu, salai, gabdi, harua, gunja, semal, dudhi, khair, prickly shrubs, such as air, bilsena, ghont, makor and stunted trees of better species, such as teak, saj, dhawa, seji, tendu, &c., are most frequently seen. A marked feature also is the occasional occurrence of straight well-developed individuals of erma and bahera. Stunted, bushy khair is often found practically pure over small areas and in the northern range kardehi is frequently met with, generally in company with ghont, the former in small thickets in and near the rocky beds of nalas, the latter occupying the higher slopes and bluffs of hills. The average height of tree species rarely exceeds 20—30 feet in this type and natural reproduction is extremely slow and uncertain.

37. As a general rule, the crop, consisting, as it does, largely of irregular coppice growth, is of inferior quality, due principally to the poverty and shallowness of the soil, to the severe climate, to long-continued destructive and uncontrolled exploitation and to the unregulated grazing of the past. Owing to these causes also natural reproduction is very poor, and this poverty is beyond remedy in view of the unfavourable soil and climate.

ARTICLE 6.—*Injuries to which the Crop is liable.*

38. The principal causes of injury are (A) grazing, (B) fire, (C) frosts, and (D) insects.

39. (*A*) *Grazing.*—These forests have for years served as grazing grounds for the cattle of the highly cultivated haveli portion of the Jubbulpore and Damoh districts. Subjoined are given the average number of cattle which resorted to the forests during the five years' period 1887-88—1891-92 (*i.e.*, before the famine materially affected their numbers) and which may hence reasonably be expected to visit these forests in times of normal prosperity. Camels, sheep and goats are not allowed to enter :—

Buffaloes.	Cows and Bullocks.	Acreage available per animal.
31,867	141,206 ...	2·9

The actual pressure on the area is very much lighter than that represented by the preceding figures, which even by themselves do not indicate excessive grazing. The private grazing areas are extensive and many cattle-owners, merely in order to keep themselves quite safe from the risk of trespass, pay for a larger number of animals than they actually need send into Government forest, especially as the grazing fees levied are so insignificant. It must also be remembered that the greater number of the cattle graze in our forests only during a part of the year, although this is the worst time for the interests of every kind of reproduction. But, although the average pressure of the grazing is light, still according to custom, encouraged by the absence of any attempt hitherto to control the grazing, cattle are concentrated at certain points, where consequently both the forest and soil have severely suffered.

40. (*B*) *Fire.*—None of the forests are self-protected. According to the soil and situation, the grass over limited acres becomes dry enough to burn as early as November-December. Without protection fires begin to rage from the early part of February, and those which occur after April are impossible to extinguish and only burn themselves out when they reach obstacles which they cannot cross. Such obstacles must, however, be several hundred yards wide, for burning leaves and twigs are carried up by whirlwinds and may be deposited at a distance of 300 yards or even further.

41. (*C*) *Night-frosts.*—These are frequent in this Division in December and January and do considerable damage to the forest growth. They effectually prevent the re-stocking of the open grass-covered blanks by cutting back year after year all young growth which may appear and also destroy the foliage, shoots, flowers and young fruit of trees. A good example of the damage done is to be seen in the Baraiyakhera Reserve, as described in more detail in the second part of para. 46 below.

42. (*D*) *Insects.*—Great damage has of late years been done to the forests of this Division by insects, especially to teak by the defoliating moth (*Paliya damastesalis*). Its life-history is as yet imperfectly known and no time should be lost in determining this and in evolving a scheme to combat the pest. Still less is known about those insects, the larvæ of which attack and completely destroy the wood of nearly all the inferior species found in these forests if cut outside the rainy season.

CHAPTER III.—System of Management.

Article 1.—*Past and Present Systems of Management.*

43. The first semblance of management began with the introduction of the Waste Land Rules in 1862, when the cutting of teak, saj, shisham and bija without the sanction of the Deputy Commissioner was forbidden. For these kinds of timber permits were granted, but with regard to other trees people could cut what they liked and where they liked. At first annual farms were given out, which conferred the right of collecting fees on unreserved kinds of timber and other produce. In 1865 or thereabouts, these forests were brought under the *régime* of the first Forest Act as Unreserved Forests, still continuing however to remain under the direct management of the Deputy Commissioner, assisted by a Darogah, and to be treated as land which was to be ultimately given up for cultivation. The system of management remained unaltered and the only connection with the Forest Department was in the fact that the revenue and expenditure were included in the accounts of the Department. In 1867-68 the Conservator gave it as his opinion that under the system of annual farms nothing whatever was done in the interests of forest conservancy, the forests were deteriorating and the farmers oppressing the people. In 1868-69 the Singrampur ramna was finally demarcated and came under departmental management. It was placed in charge of the Darogah at Gwari Ghat, a portion of whose establishment was detailed for the duty. About 1870-71 the system of annual leases gave way to one of commutation, under which people were allowed to cut where and what they liked as before, on payment of an annual commutation fee of Re.1 per household. In 1876-77, the license system was introduced, commutation being still allowed on a smaller scale. This was rather a change in the method of collecting the revenue, and the system of managing the forests remained practically unaltered. In 1879, the forests were notified as Reserves under the Indian Forest Act of 1878, but it was not until 1886-87 that the remainder of the forests were brought under departmental management. Finally, in 1893, a system of located fellings was established, which was, however, soon given up. Since then various working plans have been prepared and abandoned until the present one was finally drawn up in 1898-99.

The old system of commutation is maintained to a small extent, villagers living in the remoter parts of the district, where the working of the system of single-load licenses is practically impossible without the maintenance of a considerable additional staff of paid license-vendors, being still allowed to commute for dead wood, grass, thorns, leaves and fibre.

Article 2.—*Special Works of Improvement undertaken.*

44. Such works have been—(A) Fire-prevention, (B) Cultural operations, (C) Improvement fellings, (D) Sylvicultural experiments, (E) Lac propagation, and (F) Buildings.

45. *(A) Fire-prevention.*—This was commenced in the Singrampur ramna in 1871, in the Singhpur ramna 1875, in the Baraiyakhera, Sehri, Tindi, Phular and Bansipur ramnas in 1878, and in the Mariadoh ramna in 1885; these areas having probably been closed to grazing about the same time. Systematic measures in the Division generally were, however, not undertaken until 1893. The extent to which such measures have been successful during the past four years is shown in the subjoined statement:—

Forest year.	Acreage: Attempted to be protected.	Acreage: Actually protected.	Cost per square mile actually protected.
	Acres.	Acres.	Rs. a. p.
1895-96	192,962	187,464	6 1 8
1896-97	192,962	189,115	2 14 11
1897-98	47,576	46,559	7 9 10
1898-99	504,211	491,210	1 5 0
Average per year	234,428	228,587	2 15 2

These areas have been under what is known as "special protection," *i.e.*, have been isolated by fire traces and patrolled by a special staff of fire-guards employed from February 16th to the setting in of the rains at Rs.4 per month. Besides these areas all the remaining forests of the Division are under what is known as simple protection, which is not protection in the technical sense of the word, but only such safeguarding as can be compassed by the ordinary staff and with the aid of Section 25 *(b)* of the Forest Act. The expensive system of special protection is confined to those areas where the less expensive systems would not suffice owing to the value of the forests or to their being exceptionally liable to fire.

46. *(B) Cultural operations.*—In 1874 a bamboo plantation was established at Kishan Tal, about 1 mile from Damoh city by Colonel Thompson, who was then Deputy Commissioner. Seeds of *Bambusa arundinacea* and *Dendrocalamus strictus* were sown on the

banks of the tank and in its immediate vicinity where the soil was fairly deep, the intervening area being sown up with teak and other species. In 1876 a well was sunk and two malis appointed to look after the plantation, which was fenced and protected from grazing and fire. It appears, however, to have been carelessly looked after, the bamboo clumps were not attended to, and cattle frequently allowed to trespass. On this account, and also because the soil was probably in the majority of cases not suited to the species sown, the plantation did not thrive and at present a few fine clumps of bamboos near the tank are the only signs which indicate the position of the old plantation.

Probably about the same time as the above operation an attempt was made to extend the narrow belt of teak found on the banks of the Bearmi river in the Baraiyakhera Reserve by sowing in the more or less level area on the east of the forest; the young seedlings were, however, cut down by frost and the young shoots which were thrown up from year to year by the root-stocks were similarly killed. About four years ago it was considered that if the old stumps were cut back close to the ground young shoots might be put out, which would be sufficiently vigorous to get above the grass and the frost zone. This was accordingly done, but the resulting shoots were all killed in the first frost. The fact that this frost also killed outright several saplings on the edge of the teak belt, which were 20—30 feet in height, sufficiently demonstrates the futility of attempting to introduce teak into this area while the natural conditions are so obviously opposed to its growth.

47. (*C*) *Improvement Fellings.*—Such fellings have been made at various points in the Division over an aggregate area of about 750 acres, the oldest dating from 1892-93. These were principally carried out in 1892-93 in the central and south-western ranges, but no accurate record appears to have been kept of the area then cut, neither do these fellings appear to have been carried out on a systematic plan. The areas cut over were kept closed to grazing for only three years and were then again thrown open. Since 1897-98 systematic improvement fellings have been carried out on practically the same lines as those prescribed in this working plan.

The location of the fellings and the acreages cut over are given in Appendix III. The figures for the period preceding 1897 are entirely problematical, as it is not certain that the acreages given were actually worked over. They rather represent the areas intended to have been cut over at each place under the system of "provisional working circles," the object of which was principally to induce people to give up indiscriminate felling everywhere and resort to "located fellings."

48. (*D*) *Sylvicultural Experiments.*—Two sets of experiments have been instituted since 1898, the one to ascertain the relative and absolute injury caused by fire occurring in different months of the fire season in different types of forest; the other to discover the best time for coppicing and the effect of the coppice treatment on all our more important species and the principal forest types, including the rate of growth.

For the first experiment several sets of contiguous ¼-acre strips each, the strips in each set being similarly stocked and growing under identical conditions, have been laid out. One strip being left intact, the rest are every year burnt over in successive order at intervals of a month beginning from November. After a few years of such experiment the difference in the condition of the various strips and in the increment of the trees will give fairly trustworthy data regarding the effects, absolute and relative, of fire occurring at different times of the year.

In the second experiment also similar sets of twelve ¼-acre strips have been laid out, the successive strips being cut back in successive months from January to December. If it should be found that coppice of timber-yielding species, such as saj, seji, dhaora, &c., poles of which cut outside the rainy season possess no durability at all, is not the worse for cutting in the rains, a most important fact will have been established, having far-reaching effects on the revenue, on the exploitation of the forests and on the supply of the people.

49. (*E*) *Propagation of Lac.*—This work has been carried on in these forests with varying degrees of energy, either by departmental agency or through the lessees, from a very early date. The climate and the composition of the forests are both extremely favourable for the production of lac and but for the famine of 1896-97, during which no protection was possible against the thousands of free collectors of edible produce who swarmed all over the forests, the annual yield would now be a very large one, exceeding a net value of Rs.10,000.

50. (*F*) *Buildings.*—Only a single departmental building worth the name exists in this Division, *viz.*, the Forest Guard's chaoki at Kotatala, which was erected in 1898-99.

ARTICLE 3.—*Past Revenue and Expenditure.*

51. The average annual revenue and expenditure for the Division during the past three years (1896-97, 1898-1899) are exhibited in detail by ranges and according to budget sub-heads in Appendix IV. As the present ranges were constituted in 1897, the figures cannot be taken further back. While the revenue has been Rs.28,639, the total charges have been Rs.33,800 (A = Rs.7,623, B = Rs.26,177), thus involving a deficit of Rs.5,161. It should, however, be said that two out of the three years in question were years of famine, the effects of which were still felt also in the third year. It would therefore be fairer to take for the revenue the average figures for the five years from 1887-88 to 1891-92, which preceded the

long period of scarcity and famine now prevailing. These figures are given below parallel with those for the past three years :—

	1887-88.—1891-92.	1896-97.—1898-99.
	Rs.	Rs.
Timber and firewood	11,920	3,880
Bamboos	1,758	3,829
Grazing grass and other minor produce ...	41,893	19,876
Miscellaneous	507	1,054
Totale ...	56,078	28,639

CHAPTER IV.—Utilisation of the Produce.

Article 1.—*Marketable Products ; Quantities consumed in past Years.*

52. A list of the principal marketable products and their uses is given as Appendix V.

53. The following statement gives a brief abstract of the average quantities of these products annually consumed during the five-year period 1887-88—1891-92, *i.e.*, the period im mediately preceding the previous famine which culminated in 1896-97 :—

Description of produce.		Quantity.	Value.
			Rs. a. p.
Timber	C. ft.	105,184	9,593 13 8
Fuel	,,	352,752	
Bamboos (numbers)		368,871	1,758 0 0
Grass (pulas)		2,499,192	305 0 0
,, (contract)		...	119 0 0
Lac		...	105 0 0
Harra		...	25 0 0
Fruits (contract)		...	471 0 0
Katha		...	7 0 0
Mineral products		...	339 0 0
Hides and horns		...	463 0 0
Other minor produce		...	7,421 0 0
Total ...		... ...	20,606 13 8

Article 2.—*Lines of Export.*

54. The principal lines of export, which are all shown by black lines in the accompanying trace of the Division on the scale 1 inch = 2 miles, are as follows. The paths (ghats) leading from the Vindhyan plateaux into the low-lying cultivated lands of Jubbulpore and Narsinghpur on the east and south of the district, respectively, are all steep and not practicable for wheeled transport :—

Northern Range.

Bardha—Panchamnagar fair-weather road.
Fatehpur—Manakpur footpath.
Lohari—Rajpura fair-weather road.
Mariadoh—Patan footpath.
Hatta—Kumhari fair-weather road.
Mariadoh do. do.

Central Range.

Damoh—Jubbulpore bridged and metalled road.
Saugor do. do.
Patharia-Saugor fair-weather road.
Hatta-Faizabad road.
Batiagarh bridged and metalled road.
Hindoria-Patera bridged and metalled road.
Ghat-Piparia-Katni fair-weather road.
Balakot fair-weather road.
Bhuri-Sasna-Keolari fair-weather road.
Tejgarh-Chirai-Somelkhera fair-weather road.

Indian Midland Railway line from Saugor to Katni *viâ* Damoh.

South-Western Range.

Taradehi—Kudpura-Mohli fair-weather road.
Abhana—Tejgarh-Taradehi-Saugor fair-weather road.
Tendukhera—Patan-Jubbulpore bridged and metalled road.
Jhapan-Saugor fair-weather road

Deori Ghat.
Chanda do.
Barman do.
Pindrai do.

South-Eastern Range.

Tejgarh-Sailwara-Patan fair-weather road.
Itwa Ghat.
Katangi do.
Sakra do.
Kaimori do.
Konda do.

ARTICLE 3.—*Markets.*

55. The principal markets for the produce of these forests are the towns of Damoh, Hatta, Mariadoh, Fatehpur, Panchamnagar, Batiagarh, Bansa, Imalia, Langi, Patera, Abhana, Jabera, Sailwara, Majholi, Singrampur, Katangi, Kaimori, Patan, Tejgarh, Tendukhera, Taradehi, Kudpura and other large villages situated in the Damoh district and in the adjoining districts of Sangor, Narsinghpur and Jubbulpore. The town of Jubbulpore would take all the timber and the greater part of the firewood of the Singrampur Forest, were it not for the prohibitive toll on the Hiran river and the obstructiveness of the toll-farmers, who, if not here, at any rate elsewhere, levy from the unsophisticated cartmen contributions in addition to the sanctioned dues.

ARTICLE 4.—*Mode of Extraction and its Cost.*

56. Under the present system all fellings of green wood are confined strictly to the coupes of the year, the produce of which is either sold standing or cut departmentally. Where there are no roads, produce is carried out on men's heads, by kanwar loads, on pack-animals, or occasionally dragged along the ground by bullocks (dhusar); otherwise carts are the usual means of transport.

57. The daily wages for unskilled labour are 2 to 3 annas per adult male, 1½ to 2 annas per woman and 1 anna per child. The hire of a cart, carrying an average load of 10 maunds, is 10 to 12 annas a day; of pack-animals, 4 to 6 annas per beast per day. For dragging the payment for a pair of bullocks is 6 annas per day. The following figures give the cost of departmental work carried out at Kotatala, Singrampur and Jamunia during 1897-98 and 1898-99 :—

At Kotatala.—Cutting fuel and putting it up into stacks, 6′×4′×4′ = 96 c. ft., including coppicing of stools	2 to 2¼ annas per stack.
Cutting poles, 9 to 24 inches in girth, including coppicing,	Re.1 per cent.
At Jamunia.—Cutting teak poles, 9 to 30 inches in girth, including coppicing	12 annas to Re.1 per cent.
Carting above to Damoh (distance 8 miles)	Rs.7 per cent.
At Singrampur.—Cutting teak and other poles, 12 to 36 inches in girth, including coppicing of stools	Rs.12-6-0 per cent.
Cutting fuel and putting it up into stacks, 6′×5′×5′ = 150 c. ft., including coppicing	4 annas per stack.

ARTICLE 5.—*Net Value of each Class of Produce.*

58. The Chief Commissioner's Resolution No. 102, dated the 5th January 1893, fixes the maximum rates for grazing for all cattle belonging to residents in the Central Provinces and for forest products which are regarded as necessaries to the agricultural community, including village artisans and day labourers. A schedule of these rates is given as Appendix VI. Within these maxima, the Conservator is permitted to vary the rates according to the forests concerned and to ruling circumstances, and it is expressly ordered that the transactions which take place between the Forest Department and Contractors and other classes of the general public, and even between the Forest Department and the agricultural community for forest produce not entered in the schedule, shall be conducted on ordinary commercial principles. The current schedule of rates sanctioned by the Conservator under the above limitations is given as Appendix VII.

CHAPTER V.—MISCELLANEOUS FACTS.

ARTICLE 1.—*The Forest Staff.*

59. The strength, distribution and cost of the actual out-door and office establishments are given in Appendix VIII. The staff is weak in upper subordinates, including, as it does, only one Ranger, who is Working Plans Inspector, *i.e.*, is entrusted with the duty of assisting the Divisional Officer in laying out and marking coupes, and seeing to their exploitation in accordance with the working plan and in maintaining the control-books. Until, however, the revenue increases appreciably, any strengthening of the present staff is out of the question.

ARTICLE 2.—*Labour Supply.*

60. Labour is at present fairly easily procurable all the year round except at sowing and harvest time. If, however, the prescriptions of this plan are fully carried out, the present supply of labour will not be sufficient. This difficulty can, however, be met by establishing Forest villages as prescribed in para. 100 below.

PART II.

FUTURE MANAGEMENT DISCUSSED AND PRESCRIBED.

CHAPTER I.—Basis of Proposals.

Article 1.—*Working Circles how composed; Reasons for their Formation.*

61. From a sylvicultural point of view a single working circle would suffice, but it is convenient for administrative reasons to make four working circles co-extensive with the four existing ranges. In each circle fellings will be made at as many points as the demand and the convenience of the people will require thus fixing the number of the felling series.

Article 2.—*Compartments; Justification of the Sub-division adopted.*

62. Previous to the preparation of this plan, there were no compartments and none were necessary; those to be now adopted are the coupes prescribed in paras. 84 and 85 below, representing, as they do, the real working units.

Article 3.—*Analysis of the Crop; Method of Valuation employed.*

63. In view of the small value of the crop and the simple character of the treatment required, no valuation has been made, nor has any analysis of the crop been necessary beyond a general examination thereof.

CHAPTER II.—Method of Treatment.

64. This Chapter deals only with the exploitation of major produce (excluding bamboos), except in so far as such exploitation goes hand in hand with that of minor produce.

Article 1.—*Objects sought to be attained.*

65. Speaking generally, the object aimed at may be briefly defined to be the satisfaction of all present and prospective local requirements, while improving the stock to the fullest extent permitted by the limited means at our disposal, so as to create a surplus of valuable timber and other products (principally lac) for export to more distant and larger markets. The working of the forests should also be so regulated that no one may have to go further than 4 miles for his wood and grass and no village requiring grazing to drive its cattle out beyond that distance.

Article 2.—*Method of Treatment adopted.*

66. The nature of the soil and climate entirely forbids any hope of producing large timber, save as scattered individuals in a few exceptionally favourable localities, while at the rate at which natural reproduction by seed takes place, even a century would be too short for the production of a complete seedling crop. Reproduction by coppice must hence always be our stand-by, supplemented by the accession of a few self-sown seedlings that may come up and survive here and there. Hence, wherever there is a sale for all the firewood and small timber that can be cut, the system of coppice with standards will be adopted in its entirety; on the other hand, where the demand is practically limited to timber of sufficient size and value to bear carriage to places not endowed with forests and where wood is consequently dear, the system will be reduced to a species of coppice-jardinage, in which coppice far more than seedlings will be depended upon for the regeneration of the crop.

67. When, however, we come to areas (a very large aggregate portion of the Division), in which, owing to their remoteness from populous centres, the annual demand for wood is limited to the few head or cart-loads of firewood and the few poles of inferior species which *may* be required by the aboriginal inhabitants of jungle villages possessing a large forest area of their own and which are at present, and will likely for a long series of years to come (some of them even perhaps permanently) be utilised principally as grazing grounds, even the slight amount of regular felling described above is, for the present at least, out of the question and the treatment resolves itself merely into the unqualified reservation of the valuable timber species, of trees suitable for the production of lac and of fruit trees in a bearing condition or giving promise of fruiting well on reaching the age of fertility.

68. Thus it will be seen that wherever any systematic treatment is possible, it will be the coppice treatment that must be followed.

Article 3.—*The Exploitable Age.*

69. Under the circumstances explained above, there can, strictly speaking, be here no exploitable age, for the trees will be felled at various ages corresponding to one rotation or some multiple of a rotation. We are hence concerned only with the term rotation, meaning thereby the interval of years after which fellings come back to one and the same coupe.

70. In the soil and climate of this Division coppice shoots attain in about twenty years the size for rafters and small house-posts, which are the classes of wood most in demand. After this age is reached the growth becomes for the most part stationary, only a small number of individuals being capable of reaching larger dimensions without deteriorating; these individuals will constitute the reserve of standards, few of which, however, would advantageously be preserved beyond their sixtieth year. Thus every other consideration apart, the best rotation to adopt would be twenty years, but in most cases the necessity of always keeping a sufficient area open for grazing (all worked coupes being obviously closed for ten years after exploitation for the protection of the young coppice) calls for a rotation of thirty years.

71. For what has been called in para. 66 above, for want of an established term, coppice-jardinage, a rotation of ten years would be the most convenient, as it would enable us to quickly clear the forest of the present large proportion of stagnating or deteriorating or otherwise undesirable elements. But here again the question of providing a sufficient pasturage area imposes on us the necessity of adopting a longer term, *viz.*, twenty or thirty years, according to the intensity of the grazing pressure.

72. The areas referred to in para. 67 obviously require no rotation and no restrictions as regards grazing; but a short rotation of five years has been adopted in order, by compelling the attention of the establishment to each coupe at least once in five years, to secure for them some supervision, of which they at present get no share at all.

CHAPTER III.—The Fellings.

Article 1.—*The General Working Scheme; the Rotation and Possibility.*

73. What has been said above in paras. 65—72 indicates sufficiently the general lines on which the forests are to be worked. The areas dealt with in paras. 66, 70 and 71 have been divided into *regular felling series* or *regular series*, so termed because *regular* work is possible in them; while the areas referred to in paras. 67 and 72 have been split up into working divisions, which, because they are intended to furnish chiefly or only the requirements of *nistar*, have been designated *nistar series*. The constitution of both classes of series is exhibited in the following statement:—

Working Circle.	Regular Felling Series.					Nistar Series.			
	Serial Number.	Serial Number.	Block. Name.	Acreage.	Rotation in years.	Characteristic letter.	Serial Number.	Block. Name.	Acreage.
Northern	...	...	...	...	...	A	17	Karihara (6,272)	13,631
							18	Bardha (7,359)	
						B	14	Karkohi (part 117)	14,936
							15	Bharkura (part 14,600)	
							16	Mariadoh (219)	
						C	13	Chaopara (part 3,749)	16,271
							14	Karkohi (part 10,009)	
							15	Bharkura (part 2,513)	
						D	9	Chaoraiya ...	8,224
						E	8	Manakpura ...	5,095
						F	7	Silapri ...	7,257
						G	6	Naipar ...	6,054
						H	10	Kanora (893)	14,296
							11	Bhainsdoh (3,370)	
							12	Bari Kanora (3,322)	
							13	Chaopara (part 1,938)	
							14	Karkohi (part 4,773)	
						I	4	Ghorakhuri (4,794)	9,469
							5	Sukri (4,675)	
						J	3	Hathidol (part) ...	8,476
						K	1	Panchamnagar (2,445	15,426
							2	Saonrai (6,021)	
							3	Hathidol (part 6,960)	
								Total ...	119,135

Working Circle.	Regular Felling Series.					Nistar Series.			
	Serial Number.	Serial Number.	Block. Name.	Acreage.	Rotation in years.	Characteristic letter.	Serial Number.	Block. Name.	Acreage.
Central ...	I	19	Umraho-Jamunia ...	2,106	20	A	43	Bahera (part) ...	3,939
	II	36	Khamkhera (4,171)	12,456	30	B	43	,, ,, ...	3,320
		37	Damoh (1,335)			C	42	Balakot (part) ...	2,890
		38	Rajnagar (6,724)			D	44	Chirai (part 3,086)	4,539
		39	Kulua (226)				45	Dhaba (1,453)	
	III	40	Amata (815)	6,488	30	E	44	Chirai (part) ...	4,882
		41	Jamunia (3,844)			F	46	Somkhera ...	5,566
		43	Bahera (part 1,829)			G	47	Jamunhatri ...	6,201
	IV	42	Balakot (part) ...	8,617	30	H	24	Zer (part 3,468)	3,659
	V	30	Pando (1,234)	8,018	30		25	Kuakho (191)	
		31	Maria (6,784)			I	23	Barrat (1,165)	4,438
	VI	32	Garaghat (991)	3,287			24	Zer (part 3,273)	
		33	Golapatti (358)			J	20	Mahuadanda (2,599)	4,318
		34	Pateriya (1,476)				21	Magra (part 1,719)	
		35	Kusmi (462)			K	21	,, (part) ...	8,147
						L	21	,, (part 1,409)	3,081
							22	Hathibar (891)	
							26	Pipariya Mul (781)	
						M	27	Gudri ...	2,349
						N	28	Padri ...	3,230
						O	29	Baraiyakhera ...	5,107
			Total ...	40,972				Total ...	65,666
South-Western.	I	63	Hathidol (part 1,829)	8,880	20	A	48	Dasondi (292)	3,207
		64	Hanmathago (part 7,051)				49	Bhainskhar (274)	
							50	Parasai (2,641)	
	II	64	,, (part 747)	11,698	30	B	51	Bandopahar (163)	3,451
		66	Jamun (10,951)				52	Pateriya (part 2,511)	
	III	67	Palwa (part) (5,985)	8,765	20		53	Hardua Hathighat (777)	
		68	Deori ,, (2,780)			C	52	Pateriya (part 3,541)	5,447
							55	Sanga (part 1,906)	
						D	55	,, (part) ...	7,653
						E	54	Mohar (part) ...	5,370
						F	54	,, (part) ...	3,357
						G	56	Jhalon (522)	5,200
							57	Sehri (915)	
							59	Aonria (3,763)	
						H	58	Kuakheri (939)	11,542
							60	Lorhi (part 10,603)	
						I	60	,, (part 165)	5,593
							61	Baheria (part 5,428)	

Working Circle.	Regular Felling Series.					Nistar Series.			
	Serial Number.	Serial Number.	Block. Name.	Acreage.	Rotation in years.	Characteristic letter.	Serial Number.	Block. Name.	Acreage.
South-Western—(*concld.*)						J	61	Baheria (part 3,878)	7,114
							62	Bagdari (part 3,236)	
						K	62	,, (part) ...	5,351
						L	63	Hathidol ,, ...	4,565
						M	64	Hanmatbago (part 2,966)	3,684
							65	Gopalpur (718)	
						N	67	Palwa (part) ...	3,958
						O	68	Deori (part) ...	6,749
						P	68	,, ,, (3,633)	3,963
							69	Barbota (330	
						Q	70	Sarratura (3,977)	5,758
							71	Kaliakuhi (part 1,596)	
							73	Dhakarwaho (part 185)	
						R	71	Kaliakuhi (part 8,283)	9,931
							72	Bikrampur (1,186)	
							73	Dhakarwaho (part 462)	
						S	73	,, (part 4,189)	7,461
							74	Lagra (part 3,272)	
						T	73	Dhakarwaho (part 4,322)	6,523
							74	Lagra (part 2,201)	
						U	74	,, (part 4,530)	5,251
							77	Phular (721)	
						V	75	Dudhia (part) ...	8,194
						W	75	,, ,, ...	2,072
						X	75	,, ,, ...	2,351
						Y	76	Jamunjhiri (part) ...	4,201
						Z	75	Dudhia (part) (1,119)	5,551
							76	Jamunjhiri (part) (4,432)	
						AA	76	,, ,, ...	4,888
			Total ...	29,343				Total ...	148,385
South-Eastern.	I	84	Singrampur (6,458)	7,754	20	A	78	Deotara ...	7,807
		85	Deori (part 1,296)			B	79	Jhada ...	3,610
	II	88	Bhaonrpani (8,922)	13,226	30	C	80	Kheri ...	4,647
		89	Gidra (part 4,304)			D	81	Konda Kalan ...	1,619
	III	94	Silpura (5,864)	7,859	20	E	82	Churiari ...	6,585
		95	Mehgawan (part 1,995)			F	83	Bansipur ...	1,075
	IV	96	Sahajpur (part) ...	6,039	20	G	89	Gidra (part) ...	5,048
						H	85	Deori (part) ...	2,328
						I	86	Saonra (116)	6,719
							87	Aloni (6,603)	
						J	90	Nibhora ...	429
						K	91	Hinoti ...	9,570
						L	92	Sainpura ...	677
						M	93	Tola (part) ...	3,549
						N	93	,, ,, ...	3,466
						O	95	Mehgawan (part) ...	3,240
						P	96	Sahajpur ,, ...	5,366
			Total ...	34,878				Total ...	65,735
			Grand Total ...	105,193				Grand Total ...	398,921

74. It is needless to say that the possibility has been based on area, the size of the coupes being in inverse proportion to the density of the stocking.

Article 2.—*Period for which the Fellings have been prescribed.*

75. The fellings have been prescribed for the entire thirty years comprised in the rotation adopted for most of the Regular Felling series.

Article 3.—*Fellings whether annual or periodical ; Method of their Allotment.*

76. The coupes are intended to be annual, as detailed in the tabular statements in paras. 84 and 85 below. In the *nistar* series a fresh coupe will be opened every year irrespective of the quantity of material removed from the previous coupe. In the Regular series no fresh coupe will be opened until all the area of the coupe still under working has been gone over.

77. In the allotment of coupes in the Regular series two principles, not always reconcilable with one another, have been kept in view. To secure economy in the construction of roads and a ready sale for the produce the coupes have to begin nearest the market to be served on an existing export line and must extend progressively away from it; but, on the other hand, this principle must, when necessary, give way before a higher consideration, *viz.*, grazing requirements.

ARTICLE 4.—*Nature of, and Mode of executing, the Fellings ; Forecast of Condition of the Crop at their Conclusion.*

78. The following rules will be observed in the selection and marking of standards in the Regular series :—

(i) No trees will be reserved for the special purpose of bearing seed for reproduction, for those reserved for other reasons will yield as much seed as will be required for all practical purposes.

(ii) All fruit trees in a good bearing condition and all promising trees of timber-yielding species will be reserved, unless several of them are overcrowded together, in which case only the best will be kept so as to give them room for uninterrupted development.

(iii) For the latter portion of the preceding rule, fruit trees, if they are healthy and in good bearing condition, will generally be more valuable than others.

(iv) Subject to compliance with Rule (ii), and provided they do not require reconstituting from the stool, all kusam, ghont, chheola, ber and other trees serving as good hosts for the lac insect will be reserved.

(v) In order to economise both labour and expense, no stems less than 6 inches in girth at breast height will be marked. Where firewood is unsaleable, this limit may be raised to 9 inches.

(vi) With the same object as the preceding rule no marking will take place in areas of any extent subject to severe night-frost. Such areas will be clearly indicated to the wood-cutter by putting a ring of red paint on conspicuous stems standing along their edge.

(vii) The stems to be marked will be those to be reserved or those to be felled according as the former or the latter are in the minority.

79. The immense areas of the *nistar* coupes preclude the application thereto of the preceding rules. This is, however, no disadvantage. In view of the insignificant requirements they are intended to meet, there will be a general prohibition to cut, except under direct departmental agency, any teak, bija, kaim, haldu, harra, saj or fruit trees and trees of species serving as hosts for the lac insect, and it will hence be necessary to mark only standards of timber-yielding species not mentioned above. Only the straightest and most promising trees need be thus marked.

80. As regards the mode of felling in the Regular series it is essential that all productive stools of timber trees should be felled low enough to cause every shoot to start up from, at the highest point, ground-level, so that it may almost at once become an independent individual with a root-system of its own. Large teak should, if possible, be cut below ground-level, *i.e.*, *en terre*. In doing this the stem may be completely removed, as the section of the large lateral roots will throw up shoots, which will have all the appearance of seedlings. All crooked and otherwise unpromising teak stems under 9 inches in girth at the base should be cut back, at departmental expense if necessary, for the resulting small stools will yield shoots possessing all the qualities of seedlings, with the added advantage of rapid growth from the very start.

The stools of species yielding only firewood need not be cut so low or be smoothed off so carefully, this not because careful cutting will not profit them, but simply because the insignificant value of firewood (not even Re.1 per 100 maunds) absolutely precludes such precautions. On the one hand, with departmental felling, the expenditure would be prohibitive ; while on the other, no one would come to us for firewood if he had to undergo so much trouble in cutting it. In some cases, when there is no other way of getting rid of fuel trees, it will be allowable to pollard them, provided such pollarding is not likely to injure the growth of small neighbours of valuable species. Otherwise the old trees must be girdled ; even if girdling does not kill them, it will cause them to contract their crowns and thus enable the younger valuable neighbours to shoot away out of oppression or compression, as the case may be.

81. In the *nistar* series, in view of the uncertain and limited demand, no strict rules can be laid down. As all valuable timber-yielding species will be absolutely reserved against felling for *nistar* purposes, it will suffice to enjoin the *nistar* cutter to cut as low and as clean as he can. Should a *nistar* series at any time be called upon to meet a special demand, then the rules given in the immediately preceding paragraph will have to be observed.

82. The results of the work here prescribed will be that at the close of the period of thirty years the crooked, unsound and other undesirable elements of the existing crop will have been removed, entirely from the Regular series, and partially from the *nistar* series, their places having been taken by good reproduction from the stools and roots, and numerous seedlings will have established themselves, especially in the open places. All valuable trees will be developing under more favourable conditions than now prevail, and the crop will have improved in composition, density and growth generally.

ARTICLE 4.—*Tabular Statements of the Fellings to be made.*

83. The subjoined statements of fellings show the details of the coupes to be taken in hand each year. They will be found marked on the accompanying traces on the scale of 1 inch =1 mile. The coupes will be laid out and permanently demarcated on the ground and the standards in them selected a year in advance, *i.e.*, every coupe will always be demarcated and marked in May-June preceding the open season in which it is to be felled.

84. The following statements relate to the Regular Felling series :—

Central Working Circle.

ROTATION IN YEARS.		20	30				30			30	30		30				Total area to be felled in each year.
NUMBER OF FELLING SERIES.		I	II				III			IV	V		VI				
Number of Block		19	36	37	38	39	40	41	43	42	30	31	32	33	34	35	
Name of Block.		Umraho-Jamunia.	Khamkhera.	Damoh.	Rajnagar.	Kulua.	Amata.	Jamunia.	Bahera (part).	Balakote.	Pando (part).	Maria.	Garaghat.	Golapatti.	Pateriya.	Kusmi.	
Year.	Serial number of Coupe	Acreage.															
1899-1900 ...	1	104	...	...	368	...	...	119	...	286	...	181	...	...	132	..	1,190
1900-01 ...	2	129	...	...	274	...	...	186	...	224	...	213	...	...	84	...	1,110
1901-02 ...	3	103	713	...	...	...	...	187	...	318	215	...	...	...	74	...	1,610
1902-03 ...	4	118	...	...	280	...	...	327	...	291	...	208	...	123	...	...	1,347
1903-04 ...	5	130	...	...	284	...	258	...	...	297	...	190	...	...	66	...	1,225
1904-05 ...	6	99	...	427	...	226	...	190	...	348	352	...	...	...	112	...	1,754
1905-06 ...	7	167	...	...	327	...	...	47	158	310	...	259	121	...	...	...	1,389
1906-07 ...	8	142	...	...	372	...	...	...	254	387	...	427	193	...	...	...	1,775
1907-08 ...	9	102	627	...	...	...	...	...	350	340	...	262	156	...	...	...	1,837
1908-09 ...	10	85	...	...	325	...	...	...	175	226	...	257	...	...	56	...	1,124
1909-10 ...	11	93	...	...	348	...	...	211	...	289	...	272	...	...	47	...	1,260
1910-11 ...	12	84	...	...	539	...	...	250	...	285	...	251	...	...	74	...	1,483
1911-12 ...	13	106	595	...	...	...	...	316	...	245	...	404	...	...	...	123	1,789
1912-13 ...	14	102	...	...	302	...	...	232	...	244	...	210	...	171	...	...	1,261
1913-14 ...	15	112	...	...	246	...	279	...	...	278	334	...	...	...	102	...	1,351
1914-15 ...	16	76	...	638	...	...	...	209	...	259	333	...	...	...	139	...	1,654
1915-16 ...	17	88	...	...	298	...	...	118	...	271	...	226	216	...	...	...	1,217
1916-17 ...	18	80	...	...	341	...	...	196	...	341	...	337	151	...	...	...	1,446
1917-18 ...	19	77	727	...	...	...	...	180	...	233	...	259	154	...	...	...	1,630
1918-19 ...	20	109	...	...	355	...	...	...	146	339	...	224	...	...	55	...	1,228
1919-20 ...	21	104	...	...	291	...	...	237	...	335	...	254	...	...	87	...	1,308
1920-21 ...	22	129	...	...	327	...	...	241	...	230	...	538	...	...	...	176	1,641
1921-22 ...	23	103	480	...	...	...	...	191	...	245	...	312	...	...	...	163	1,493
1922-23 ...	24	118	...	...	305	...	...	266	...	255	...	202	...	64	...	...	1,210
1923-24 ...	25	130	...	...	380	...	278	...	...	290	...	284	...	...	80	...	1,442
1924-25 ...	26	99	321	270	...	...	...	142	...	335	...	260	...	...	88	...	1,515
1925-26 ...	27	167	...	...	230	...	...	...	180	270	...	196	...	...	77	...	1,120
1926-27 ...	28	142	...	...	301	...	...	...	140	261	...	328	...	...	72	...	1,244
1927-28 ...	29	102	708	...	...	...	...	...	206	279	...	230	...	...	58	...	1,583
1928-29 ...	30	84	...	...	231	...	...	...	220	306	...	...	...	...	73	...	914
Total area to be felled.		3,284	4,171	1,335	6,724	226	815	3,844	1,829	8,617	1,234	6,784	991	358	1,476	462	42,150
Total area of Felling series.		2,106	12,456				6,488			8,617	8,018		3,287				40,972

South-Western Working Circle.

ROTATION IN YEARS.		20		30		20				Total area to be felled in each year.
NUMBER OF FELLING SERIES.		I		II		III				
Number of Block.		63	64	64	66	67	68			
Name of Block.		Hathidol (part).	Hammatbago (part).	Hammatbago (part).	Jamun.	Palwa (part).	Deori (part).			
Year.	Serial number of Coupe.	Acreage.								
1899-1900 ...	1	554	...	...	464	452	...			1,470
1900-01 ...	2	663	...	...	655	436	...			1,754
1901-02 ...	3	...	469	...	342	642	...			1,453
1902-03 ...	4	...	429	...	331	356	...			1,116
1903-04 ...	5	...	344	...	248	502	...			1,094
1904-05 ...	6	...	273	...	333	...	333			939
1905-06 ...	7	...	282	...	252	...	331			865
1906-07 ...	8	...	268	...	211	...	406			885
1907-08 ...	9	...	354	...	498	...	411			1,263
1908-09 ...	10	...	589	...	389	...	198			1,176
1909-10 ...	11	...	401	...	393	945	...			1,739
1910-11 ...	12	612	...	...	512	328	...			1,452
1911-12 ...	13	...	269	...	269	740	...			1,278
1912-13 ...	14	...	514	...	294	638	...			1,446
1913-14 ...	15	...	560	...	391	579	...			1,530
1914-15 ...	16	...	446	...	199	...	212			857
1915-16 ...	17	...	337	...	219	...	332			888
1916-17 ...	18	...	584	...	530	...	353			1,467
1917-18 ...	19	...	531	...	292	86	204			1,113
1918-19 ...	20	...	401	...	265	281	...			947
1919-20 ...	21	554	...	...	215	452	...			1,221
1920-21 ...	22	663	...	...	427	436	...			1,526
1921-22 ...	23	...	469	...	199	642	...			1,310
1922-23 ...	24	...	429	...	406	356	...			1,191
1923-24 ...	25	...	344	...	326	502	...			1,172
1924-25 ...	26	...	273	...	468	...	333			1,074
1925-26 ...	27	...	282	...	556	...	331			1,169
1926-27 ...	28	...	268	...	602	...	406			1,276
1927-28 ...	29	...	354	...	665	...	411			1,430
1928-29 ...	30	...	589	747	...	...	198			1,534
Total area to be felled ...		3,046	10,059	747	10,951	8,373	4,459			37,635
Total area of Felling series		8,880		11,698		8,765				29,343

South-Eastern Range Working Circle.

ROTATION IN YEARS.		20		30		20		20	Total area to be felled each year.
NUMBER OF FELLING SERIES.		I		II		III		IV	
Number of Block.		84	85	88	89	94	95	96	
Name of Block.		Sigrampur.	Deori (part).	Bhaonrpani.	Gidra (part).	Silpura.	Mehgawan (part).	Sahajpur (part).	
Year.	Serial number of Coupe.	Acreage.							
1899-1900	1	398	...	498	...	383	...	351	1,630
1900-01	2	306	...	581	...	333	...	381	1,601
1901-02	3	385	...	357	...	384	...	388	1,514
1902-03	4	400	...	509	...	268	...	370	1,547
1903-04	5	305	...	611	...	430	...	427	1,773
1904-05	6	316	...	457	...	303	...	327	1,403
1905-06	7	287	...	417	...	489	...	307	1,500
1906-07	8	316	...	571	...	...	425	302	1,614
1907-08	9	489	...	481	...	...	585	239	1,794
1908-09	10	391	...	504	...	362	...	242	1,499
1909-10	11	378	...	594	...	357	...	338	1,667
1910-11	12	360	...	389	...	380	...	264	1,393
1911-12	13	297	...	312	...	349	...	215	1,173
1912-13	14	...	459	404	...	301	...	281	1,445
1913-14	15	...	425	202	...	448	...	371	1,446
1914-15	16	...	412	479	...	383	...	270	1,544
1915-16	17	552	...	336	...	302	...	341	1,531
1916-17	18	432	...	326	...	...	471	268	1,497
1917-18	19	480	...	438	...	...	514	175	1,607
1918-19	20	366	...	...	391	392	...	182	1,331
1919-20	21	398	...	...	266	383	...	...	1,047
1920-21	22	306	...	...	568	333	...	...	1,207
1921-22	23	385	...	...	415	384	...	...	1,184
1922-23	24	400	...	...	333	268	...	...	1,001
1923-24	25	305	...	456	...	430	...	...	1,191
1924-25	26	316	...	...	468	303	...	...	1,087
1925-26	27	287	...	...	411	489	...	...	1,187
1926-27	28	316	...	...	553	...	425	...	1,294
1927-28	29	489	...	...	474	...	585	...	1,548
1928-29	30	391	...	...	425	362	...	...	1,178
Total area to be felled	...	10,051	1,296	8,922	4,304	8,816	3,005	6,039	42,433
Total area of Felling series	...	7,754		13,226		7,859		6,039	34,878

85. The areas and succession of the *nistar* coupes are exhibited in the next statement:—

Working Circle.	SERIAL No. OF COUPES.			1	2	3	4	5	Acreage of *nistar* series.	
	YEARS IN WHICH TO BE WORKED.			1899-1900	1900-01.	1901-02.	1902-03.	1903-04.		
	Series.	*Block.* Serial No.	*Block.* Name.	Acreage of Coupe.						
Northern.	A	17	Karibara	2,976	2,224	1,072	...	...	6,272	13,631
		18	Bardha	...	...	1,330	3,023	3,006	7,359	
	B	15	Bharkura (part) ...	2,563	2,833	3,017	2,888	3,299	14,600	14,936
		16	Mariadoh	...	219	...	...	...	219	
		14	Karkohi (part) ...	117	...	...	...	...	117	
	C	15	Bharkura (part) ...	...	...	...	2,513	...	2,513	16,271
		14	Karkohi (part) ...	...	3,249	3,441	...	3,319	10,009	
		13	Chopra (part) ...	2,661	1,088	...	...	...	3,749	
	D	9	Chaoraiya	1,578	2,181	1,561	1,446	1,458	8,224	
	E	8	Manakpura... ...	885	1,347	1,050	1,037	776	5,095	
	F	7	Silapri	1,222	1,218	1,765	1,911	1,141	7,257	
	G	6	Naipar (part) ...	1,519	1,315	882	995	1,343	6,054	
	H	10	Kanoda	...	...	893	...	...	893	14,296
		11	Bhainsdo	...	2,480	890	...	...	3,370	
		12	Bari Kanora ...	3,322	...	...	...	...	3,322	
		13	Chaopara (part) ...	...	...	781	1,157	...	1,938	
		14	Karkohi (part) ...	...	...	...	1,253	3,520	4,773	
	I	5	Sukri	...	...	1,032	1,695	1,948	4,675	9,469
		4	Ghorakhuri ...	2,128	1,739	927	...	...	4,794	
	J	3	Hathidol (part) ...	2,010	1,522	1,569	1,576	1,799	8,476	
	K	3	" " ...	...	...	1,674	3,110	2,176	6,960	15,426
		2	Saonrai	...	3,179	1,713	...	1,129	6,021	
		1	Panchamnagar ...	2,445	...	...	...	...	2,445	
			Total ...	23,426	24,594	23,597	22,604	24,914	119,135	
Central.	A	43	Bahera (part) ...	791	912	738	859	639	3,939	
	B	43	" " ...	575	524	669	783	769	3,320	
	C	42	Balakot (part) ...	495	725	778	411	481	2,890	
	D	45	Dhaba	859	594	...	...	...	1,453	4,539
		44	Chirai (part) ...	...	...	1,205	946	935	3,086	
	E	44	" " ...	834	945	1,098	1,184	821	4,882	
	F	46	Somkhera	1,557	1,206	930	786	1,087	5,566	
	G	47	Jamunhatri ...	1,337	1,119	1,282	1,182	1,281	6,201	
	H	24	Zer (part)	354	834	790	663	827	3,468	3,659
		25	Kuakho	191	...	...	...	...	191	
	I	24	Zer (part)	...	773	943	725	832	3,273	4,438
		23	Barrat	763	402	...	...	...	1,165	
	J	20	Mahuadanda ...	466	...	636	989	508	2,599	4,318
		21	Magra (part) ...	...	939	278	...	502	1,719	
	K	21	" " ...	1,700	1,669	1,396	1,703	1,679	8,147	

Working Circle.	Series.	Block. Serial No.	Block. Name.	1	2	3	4	5	Acreage of *nistar* series.
	SERIAL No. OF COUPES.			1	2	3	4	5	
	YEARS IN WHICH TO BE WORKED.			1899-1900.	1900-01.	1901-02.	1902-03.	1903-04.	
				Acreage of Coupe.					
Central.—(*Concld.*)	L	21	Magra (part) ...	652	757	...	...	...	1,409 } 3,081
		22	Hathibar	...	...	459	432	...	891
		26	Piparia Mul ...	...	...	...	...	781	781
	M	27	Gudri	562	374	448	448	517	2,349
	N	28	Padri	355	858	667	781	569	3,230
	O	29	Baraiyakhera ...	805	790	989	986	1,537	5,107
			Total ...	12,296	13,421	13,306	12,878	13,765	65,666
South-Western.	A	48	Dasondi	...	...	...	...	292	292 } 3,207
		49	Bhainskhar ...	...	...	...	274	...	274
		50	Parasai	565	771	605	360	340	2,641
	B	52	Pateriya (part) ...	504	742	620	645	...	2,511 } 3,451
		51	Bandopahar ...	...	...	163	...	...	163
		53	Hardua Hathighat ...	...	...	...	...	777	777
	C	52	Pateriya (part) ...	888	1,228	1,081	...	344	3,541 } 5,447
		55	Sanga (part) ...	...	...	...	1,098	808	1,906
	D	55	" " ...	1,544	1,669	995	1,780	1,665	7,653
	E	54	Mohar " ...	1,292	1,222	982	1,076	798	5,370
	F	54	" " ...	702	723	614	712	606	3,357
	G	59	Aonria	949	923	668	1,223	...	3,763 } 5,200
		56	Jhalon	...	...	522	...	...	522
		57	Sehri	...	...	...	...	915	915
	H	58	Kuakheri	939	...	...	...	...	939 } 11,542
		60	Lorhi (part) ...	1,133	2,209	2,012	2,676	2,573	10,603
	I	61	Baheria (part) ...	1,370	1,158	1,436	771	693	5,428 } 5,593
		60	Lorhi (part) ...	42	...	123	...	...	165
	J	61	Baheria (part) ...	1,651	2,011	...	...	216	3,878 } 7,114
		62	Bagdari " ...	...	...	1,196	922	1,118	3,236
	K	62	" " ...	1,552	829	948	1,034	988	5,351
	L	63	Hathidol " ...	1,371	654	712	756	1,072	4,565
	M	64	Hanmatbago (part) ...	1,073	686	745	462	...	2,966 } 3,684
		65	Gopalpur	...	...	...	...	718	718
	N	67	Palwa (part) ...	856	482	781	1,007	832	3,958
	O	68	Deori " ...	875	1,192	1,985	1,544	1,153	6,749
	P	68	" " ...	...	920	764	888	1,061	3,633 } 3,963
		69	Barbota	330	...	...	...	...	330
	Q	70	Sarraturia	1,150	763	1,086	978	...	3,977 } 5,758
		71	Kaliakuhi (part) ...	...	...	...	...	1,596	1,596
		73	Dhakarwaho (part) ...	...	185	...	...	...	185
	R	71	Kaliakuhi (part) ...	1,746	2,539	1,380	1,109	1,509	8,283 } 9,931
		72	Bikrampur	...	...	...	...	1,186	1,186
		73	Dhakarwaho (part) ...	74	...	...	388	...	462

Working Circle.	Series.	Block. Serial No.	Block. Name.	1	2	3	4	5	Acreage of *nistar* series.	
	SERIAL No. OF COUPES.			1	2	3	4	5		
	YEARS IN WHICH TO BE WORKED.			1899-1900.	1900-01.	1901-02.	1902-03.	1903-04.		
				Acreage of Coupe.						
South-Western—(*Concld.*)	S	73	Dhakarwaho (part) ...	1,176	1,792	1,221	...	...	4,189	7,461
		74	Lagra (part) ...	...	...	161	1,694	1,417	3,272	
	T	74	" " ...	1,329	872	...	...	...	2,201	6,523
		73	Dhakarwaho (part) ...	...	606	880	1,511	1,325	4,322	
	U	74	Lagra (part) ...	935	1,004	940	967	684	4,530	5,251
		77	Phular	...	...	...	...	721	721	
	V	75	Dudhia (part) ...	1,147	1,801	2,087	1,606	1,553	8,194	
	W	75	" " ...	393	261	564	299	555	2,072	
	X	75	" " ...	592	446	437	504	372	2,351	
	Y	76	Jamunjhiri (part) ...	719	748	867	712	1,155	4,201	
	Z	76	" " ...	1,227	991	815	1,399	...	4,432	5,551
		75	Dudhia (part) ...	...	...	...	...	1,119	1,119	
	AA	76	Jamunjhiri (part) ...	842	1,076	1,032	1,118	820	4,888	
			Total ...	28,966	30,503	28,422	29,513	30,981	148,385	
South-Eastern.	A	78	Deotara	1,302	1,876	1,857	1,600	1,172	7,807	
	B	79	Jhada	769	747	842	604	648	3,610	
	C	80	Kheri	924	933	850	954	986	4,647	
	D	81	Konda Kalan ...	328	318	352	314	307	1,619	
	E	82	Churiari	1,339	881	1,785	1,277	1,303	6,585	
	F	83	Bansipur	235	157	258	224	201	1,075	
	G	89	Gidra (part) ...	1,007	856	954	1,303	928	5,048	
	H	85	Deori " ...	453	523	475	440	437	2,328	
	I	87	Aloni	1,253	1,746	1,347	1,316	941	6,603	6,719
		86	Saonra	116	...	...	...	...	116	
	J	90	Nibhora	95	81	86	93	74	429	
	K	91	Hinoti	1,652	1,679	2,113	1,811	2,315	9,570	
	L	92	Sainpura	174	91	128	132	152	677	
	M	93	Tola (part) ...	776	905	539	577	752	3,549	
	N	93	" "	784	633	674	601	774	3,466	
	O	95	Mehgawan (part) ...	746	445	832	658	559	3,240	
	P	96	Sahajpur (part) ...	995	877	1,352	1,215	927	5,366	
			Total ...	12,948	12,748	14,444	13,119	12,476	65,735	
Total acreage to be gone over each year...				77,636	81,266	79,769	78,114	82,136	398,921	

CHAPTER IV.—SUPPLEMENTARY REGULATIONS.

ARTICLE 1.—*Cleanings, Thinnings or other Improvement Fellings.*

86. Owing to the unfavourable conditions for forest vegetation which prevail in this Division, trees shortly after reaching maturity are suddenly seen to become stag-headed and then die. Hence, even with the most careful selection of standards, many of the latter can scarcely be expected to survive through a second complete rotation in the Regular series. The more valuable of such trees will be extracted either departmentally or by sale standing to special purchasers, the rest will be cleared with other dead and fallen material upon the removal of which there will be no restrictions, such as would be necessary if wood of this class fetched high prices in these forests and thus offered an inducement to thieves.

87. Climbers will always be cut wherever they are seen doing damage, and this will constitute a part of the regular duties of Forest Guards, who will each be supplied with a light axe which he must always carry about with him when out on his rounds.

ARTICLE 2.—*Regulation of Grazing.*

88. The old reserves which have been closed to grazing for several years, all of which may be expected to yield valuable large timber and the closure of which on account of the small area concerned will be no hardship to local villagers, will continue to be strictly closed. These are as follows :—

Range.	Name of Reserve.	Acreage.
Northern	Mariadoh	219
	Singhpur	1,525
Central	Baraiyakhera	790
	Nimkhera	99
South-Western	Tindni	592
	Phular	328
	Sehri	111
	Gopalpur	94
South-Eastern	Singrampur	6,458
	Bansipur	1,075
	Total ...	11,291

89. In addition to the above, the following will also be closed :—(i) All areas in the Regular series for ten years from the date of being felled over (as the demand is in few places equal to anything like what may be cut out from a sylvicultural point of view, the Conservator will decide when an area has been sufficiently felled over to require being closed); (ii) all areas which have come under improvement fellings since 1897, and (iii) any areas of limited extent which, being exceptionally well stocked with valuable trees, may, with the sanction of the Chief Commissioner, be considered to require being closed for reproductive purposes.

90. Even when the above scheme is in full operation, the areas open to cattle in the several ranges will never be less than those given in the statement below, an inspection of which will show that the provision for grazing is ample, never less than an area of 453,535 acres out of the total area of 506,271 acres comprising the forest of the Division :—

Range.	Minimum Acreage open to Grazing			Remarks.
	In Regular Series.	In *Nistar* Series.	Total.	
Northern	...	119,748	119,748	
Central	26,872	63,401	90,273	Average acreage per head of cattle expected in most prosperous times = 2·6
South-Western	16,621	146,468	163,089	
South-Eastern	15,765	64,660	80,425	
Total ...	59,258	394,277	453,535	

91. In order to diminish the risk of trespass by cattle, the boundaries of the closed areas should be clearly marked by a rough dead fence formed by heaping up along them unexported brushwood from the coupes.

ARTICLE 3.—*Works of Artificial Reproduction.*

92. Owing to the low value of timber and the small demand consequent on the large extent of private forests and to the inherent difficulties presented by the soil and climate, no departmental work will be undertaken, but every effort will be made to afforest blanks and thinly-stocked places by allowing and encouraging temporary cultivation therein. As practically all areas with soils suitable for permanent cultivation have already been taken up by the Land Revenue Department, the cultivation in our forests will necessarily be of the temporary character beloved of our forest population, but sufficiently prolonged in each place to secure our main object, *viz.*, afforestation with valuable and useful species.

93. To this end Forest villages will be established, numerous and well-distributed enough for every coupe to lie within accessible distance of some one village at least. As the villagers will always, under the system of temporary cultivation here described, have large areas for cultivation outside in the coupes, the extent of cultivable land within the limits of a village need not be large and such land should by preference include as much as possible the few patches of black soil still remaining to us, so as to guarantee the permanence of the village. The adjunct of a permanent supply of good water is of course a *sine quâ non.* Every villager will have a free allotment of 10 acres or so in a neighbouring coupe, in which he will every year sow with his own crops seeds of teak and in the last year of his occupation also tinas, khair, saj and other valuable species adapted to the locality. As the teak seed of these provinces does not, as a rule, germinate in the first year, and as a certain proportion of it does not germinate until the third and even fourth years, the effect of the annual scattering of the teak seed and the addition of the other seeds in the last year will be to sow up the land completely, so that an abundant crop of seedlings will be the result in the last year of its occupation, These seedlings will have in their first year a loosened and grass-free soil in which to send their tap-roots down to a sufficient depth to be able to resist the drought of the ensuing hot weather and the temporary cultivation of the soil will continue to re-act favourably on their subsequent development for another year or two. In this way it will be possible to cover up without expense nearly all the waste places within our boundaries with vigorous forest growth composed of valuable species suited to the soil and the locality.

94. In order to encourage such cultivation, each man who loyally carries out the conditions on which he receives his allotment will have his *nistar* free and also free grazing for 4 head of cattle. He will not be moved from his allotment until he wishes of his own accord to leave it, when he will be given elsewhere a fresh area to cultivate on the same terms. Considering the inferior soils in our forests, it is expected that no allotment will be kept by anyone more than four years. As far as possible, all fresh allotments will be given in the current coupe and there will be no objection to the assignee *cutting back* all inferior woody growth. He may also cut down the coppice shoots that may come up among his crops and sever the roots which catch his plough. He may also be allowed to grub up old stumps unsuitable for coppice, which have been previously indicated to him by the Forest Officer. Further interference than this with the forest growth will not be permitted.

ARTICLE 4.—*Improvements common to the whole Area.*

95. These fall under (A) Protection from Fire, (B) Roads, (C) Buildings and Wells, and (D) Systematic Organisation of Forest Villages.

(*A*)—*Protection from Fire.*

96. An attempt will be at once made to work up to the principles laid down in para. 52 of the Annual Progress Report of this circle for 1896-97. Briefly put, they are that all areas containing young growth (practically all areas closed to grazing), all areas rich in lac and all otherwise specially valuable portions of forest shall be placed under A degree of protection; that the former, when the stock has become old enough to be above danger from cattle and are opened out to grazing, shall cease to require the services of a special fire-preventive establishment additional to the regular establishment maintained throughout the year for general protective purposes; and that the third or C degree of protection shall be confined to areas maintained and treated principally or exclusively as pasture lands. When ten years hence this working plan will be in full operation, the percentages of areas under the three degrees will be approximately 30, 45 and 20 respectively.

Whenever possible, the grass and other combustible refuse should be cleared from under lac-bearing trees.

(*B*)—*Roads.*

97. The most urgent improvement is the construction of roads and the following statement includes those lines of export which are at present necessary to tap the more valuable forests. The revenue being small, the question of funds is the greatest obstacle in this matter, and as it is possible that many of the following roads may be constructed and repaired by the District authorities, it has been considered best not to prescribe the completion of the road construction scheme within a short period of years, but to distribute the work and also the

expenditure (much of which, it is hoped, may thus be saved) over the entire period of thirty years. Once constructed, these roads will always be kept up in good repair, which it is estimated will cost Rs.5 per mile. Temporary feeder roads abutting on them will have to be made as the various coupes come to be worked, but the expenditure on these will always be small, and will, it is considered, be sufficiently met from savings on the estimates given below. The roads here mentioned are all shown by dotted red lines in the accompanying trace of the Division on the scale 1 inch = 2 miles:—

Serial number.	From	To	Length in miles.	Cost per mile.	Total cost.
		Northern Range.		Rs.	Rs.
1	Lohari	Rajpura	21	200	4,200
2	Mariadoh	Patan	9	200	1,800
		Total ...	30	...	6,000
		Central Range.			
1	Bansa	Balakot	10	80	800
2	Damoh	Do.	15	80	1,200
3	Bansa	Tejgarh	7	60	420
4	Maru Tal	Bahera	11	60	660
5	Ghatera...	Ghat Piparia	5	150	750
6	Fatehpur	Magra	6	150	900
7	Damoh	Ghat Piparia	18	150	2,700
		Total ...	72	...	7,430
		South-Western Range.			
1	Deori	The Ghat itself	½	700	350
2	Barman	Do.	1½	550	825
3	Pindrai	Do.	1½	550	825
4	Sehri	Saugor District	10	60	600
5	Kudpura	Do.	6	60	360
6	Abhana	Tejgarh	10	50	500
		Total ...	29½	...	3,460
		South-Eastern Range.			
1	Amjhir	Katangi	3	80	240
		Katangi Ghat	½	3,000	1,500
2	Sailwara	Itwa	7	80	560
		Itwa Ghat	2	437½	875
		Total ...	12½	...	3,175
		GRAND TOTAL ...	144	...	20,065

98. The rates vary according to the nature of the ground and the kind of road to be constructed. The heaviest expenditure will be required in improving the existing ghats or passes through the hills and the crossings of streams and nalas.

(C)—*Buildings and Wells.*

99. As necessary as roads, or even more so, are comfortable and sanitary quarters with good drinking water for the out-door staff and a sufficient number of rest-houses to enable the Divisional Officer to be independent of tents and thus move about freely during the

rains, when alone the results of the previous season's fellings and the progress of reproduction can be properly studied. Most of the Guards at present live in wretched hovels or in the out-houses and sheds belonging to malguzars and private owners. It is therefore proposed to construct the following buildings and wells, the sites in each case being fixed by the Divisional Forest Officer with the previous consent of the Conservator:—

Range.	Buildings.									Wells, at Rs.100.	
	Officers' Rest-houses, at Rs.800.		Rangers' quarters with office, at Rs.900.		Sub-range quarters with one room for Range Officer on tour, at Rs.500.		Forest Guards' chaokis with one room for Range or Sub-Range Officer on tour, at Rs.140.		Total cost.		
	No.	Cost Rs.	No.	Cost Rs.	No.	Cost Rs.	No.	Cost Rs.	Rs.	No.	Cost Rs.
Northern	4	3,200	1	900	3	1,500	34	4,760	10,360	3	300
Central	3	2,400	1	900	3	1,500	39	5,460	10,260	3	300
South-Western ...	6	4,800	1	900	3	1,500	31	4,340	11,540	3	300
South-Eastern ...	2	1,600	1	900	2	1,000	23	3,220	6,720	3	300
Total ...	15	12,000	4	3,600	11	5,500	127	17,780	38,880	12	1,200

(D)—*Establishment of Forest Villages.*

100. A weak point in the administration of the Division is the entire absence of Forest villages. No time will be lost in remedying this defect. The number of villages to be established and their distribution will be regulated by the considerations developed in paras. 92—94 above.

The rules which govern their establishment, constitution and management are prescribed in Revenue Book Circular VII (2). In order to complete their organisation their boundaries should be clearly defined by permanent serially numbered marks. A map of each village on the scale of 16 inches = 1 mile should be made, showing, besides its boundaries, the village site and the limits of each field or holding, which should be distinguished by a serial number. A field register should be prepared and kept corrected up to date giving the serial number of the fields, their respective acreages, the names and castes of the tenants, the nature of the crops grown, the rate of assessment and the amount of rent. The maximum number of plough and of milch-cattle allowed to be kept and grazed free by the several families will be fixed, and every attempt at professional cattle-breeding or herding will be suppressed, and to this end an accurate return of cattle kept by each family will be prepared on the 1st July of each year and submitted to the Divisional Officer on the earliest subsequent date, and a copy thereof kept in the range and sub-range offices for the purpose of subsequent verification from time to time.

CHAPTER V.—Miscellaneous.

Article 1.—*Exploitation of Bamboos.*

101. At present the demand for bamboos is nowhere so large as to make restrictions confining their exploitation to certain areas necessary. Later on, if the demand increases considerably, it may be advisable to separate certain compact areas where an attempt will be made to work the bamboos systematically, all clumps being scientifically thinned. The preservation of all shoots less than two years old will, however, always be insisted on.

Article 2.—*Utilisation of Minor Produce.*

102. *Lac.*—The most important of all such produce is lac, the ghont tree being here specially adapted for it. Kusam, chhiula and ber trees should also be utilised. The pruning of the trees should not be neglected; at the same time it should not be overdone, for if the new shoots increase too rapidly in thickness, such expansion together with the resulting excessive thickening of the suberous layer of the bark will be unfavourable to the lac insect and its encrustations. Care must be taken to recover, after the insects have swarmed out and have covered themselves up with their encrustation, the broken (brood) lac placed on the trees for the purpose of propagation. It is worth trying whether the insects will not spread sufficiently, if the brood lac is hung up in small baskets suspended at different points in the crowns, as there would then be no difficulty whatsoever in recovering the empty encrustations.

103. *Mahua.*—The measures taken for the more extended utilisation of the mahua flower (*viz.*, leasing for 3-year periods at a time the entire crop to the abkari contractor), which have been nullified by the advent of the present famine, should be resumed.

104. *Katha.*—The katha-boiling industry should be given more encouragement than it has hitherto received. The *khairwas* should be given an uninterrupted succession of practicable areas, thus bringing about sustained manufacture and systematic exploitation. It is for consideration whether for the first two or three years operations should not be carried on in conjunction and constant communication with the officers in charge of the Jubbulpore and Saugor Divisions, so that one or more katha-boiling circles may be established independent of the felling series and irrespective of the limits of each Division. Also see Appendix IX.

The *khairwas* should obviously be required to cut back carefully all trees likely to throw up good coppice.

105. *Grass.*—Every endeavour should be made to dispose of as much grass as possible with the double object of making revenue and diminishing the frequency and destructiveness of forest fires. The rates of royalty must therefore be pitched low and in inverse proportion to the distance of the forest from the place of demand. It is in the coupes that will be closed to grazing immediately after exploitation that the grass will be most abundant and most dangerous; its removal should hence be encouraged, even if it is necessary to give it away free. A useful measure with reference to prosperous villages possessing an insufficiency of grass lands will be to levy a small annual fee from those inhabitants who are willing to commute by means of a single trifling annual payment for the right to take out as much grass as they want and whenever they care to take it out.

106. With respect to other articles of minor produce no special directions need be given in this working plan.

ARTICLE 5.—*Control of the Working Plan.*

107. The prescriptions of the Forest Department Code in regard to the maintenance of Control Books will be strictly observed. Although the annual returns in Forms 2 and 3 will give figures by working circles, yet for the purposes of the Divisional Officer and his Assistants and the revision of the working plan, details will be kept in the Divisional Office by felling series. These details will be obtained directly from the "Accomplished" portion of the Plan of Operations Forms. The Forest Journal will be kept in the form and manner prescribed by the Conservator; by the entries made in it, it should be possible after a few years to arrive at a complete and accurate knowledge of the habits and requirements of our principal trees, so that the best possible system of treatment to follow in order to attain a given object may be devised with ease and certainty.

108. At the same time that the Control Books and Forest Journal are maintained, a book should be opened for a complete description of compartments, which, as said in paragraph 62 above, will be the coupes themselves. A complete opening of the book will be given to each compartment. At the top of the left-hand page will be made a sketch, on the scale of 4 inches=1 mile, of the compartment, the serial numbers of the surrounding compartments, &c., being indicated, and within the limits of the compartment the distribution of the various types of forest will be shown by means of washes and lines of representative colours.

The following colours will be employed :—

(*a*)	For teak	Green.
(*b*)	„ khair	Carmine.
(*c*)	„ bamboos	Gamboge.
(*d*)	„ bija	Dark blue.
(*e*)	„ mixed forest of inferior timber trees	Sepia.
(*f*)	„ „ „ „ inferior species	Burnt sienna.
(*g*)	„ Blank	No colour.

The predominating type will be indicated by a ground wash of its representative colour, and a mixture with it of other species by parallel lines, the lines being vertical when the mixture is marked, horizontal when it is only slight. A type will be considered to predominate when the species representing it composes more than half the crop. When more than one type is in mixture with the predominating type, the several types in mixture will be represented by alternating lines of the respective representative colours. The above instructions will be best understood by means of a few examples :—

(i)	Complete blank	No colour at all.
(ii)	Grassy blank dotted with inferior species,	Horizontal lines of burnt sienna on uncoloured ground.
(iii)	Very open forest with khair	Vertical carmine lines on uncoloured ground.
(iv)	Bamboo forest with a sprinkling of teak ...	Horizontal green lines on gamboge ground.
(v)	Bamboo forest with a considerable number of teak, inferior timber trees and inferior species.	Alternating green, sepia and burnt sienna vertical lines on gamboge ground.

And so on.

Types (*e*) and (*f*) include several species. As the stock colouring will not show what individual species are present, these will be specified in the verbal description under the heading of "Stock."

109. The headings of the verbal description will be (1) configuration, aspect and elevation, (2) soil and underlying rock, (3) stock, (4) reproduction present, (5) communications, (6) distance in miles from market or markets or from where the produce is used up. As far as possible the verbal description, beginning immediately below the stock map, should be completed on the left-hand page, the right-hand page being reserved for date or dates of felling and for special remarks made from time to time on the progress of the crop, accidents of frost, fire, &c., occurring, and such other noteworthy circumstances, each remark being signed and dated. Thus the right-hand page will contain a complete history of the compartment during the currency of this working plan.

110. The acreage of the compartment will be written at the top of the left-hand page immediately after the specification of the compartment.

Article 4.—*Revision of the Working Plan.*

111. It is impossible to foretell when a revision of the present plan will become necessary; it is, however, right to say that unless a radical change of procedure is called for, it will suffice to insert in their proper places the few alterations or additions that may from time to time become imperative. Should it be found that a Regular series is unworkable, it will be at once removed from the Regular to the *nistar* series list, and its 30 or 20 coupes, as the case may be, reduced to 5 by grouping 6 or 4 of them together, as the case may require, into one. On the other hand, should the demand for wood on a *nistar* series increase sufficiently to allow of its regular working, there will be no difficulty in transferring it from the *nistar* to the Regular series list and splitting up each of its coupes into 4, 5 or 6 coupes according to the grazing pressure to be met.

Article 5.—*Changes proposed in the Forest Staff.*

112. As long as the revenue remains stationary, no increase of establishment can be given; and, indeed, this matter may be left to the discretion of the Conservator acting under the orders of the Chief Commissioner.

Article 6.—*Financial Results of proposed Working.*

113. The following estimate of average annual revenue and expenditure has beeu made on the assumption that the Damoh and adjoining districts have regained their normal condition. Although most of the expenditure on roads and buildings may have to be incurred during the first few years, the figures under those sub-heads have been spread over the entire period of thirty years for which the plan provides, otherwise the charges would have to be exaggerated :—

Budget Heads.	Particulars.	Range.				Divisional Office.	Total.
		Northern.	Central.	South-Western.	South-Eastern.		
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
R I & II *a*	Timber	500	2,000	1,200	3,000	...	6,700
„ „ *b*	Firewood and charcoal ...	600	2,000	1,500	1,500	...	5,600
„ „ *c*	Bamboos	900	1,000	600	1,500	...	4,000
„ „ *d*	Grazing and grass	7,600	8,000	12,000	9,000	...	36,600
„ „ *e*	Other minor produce ...	5,000	1,600	2,000	2,500	...	11,100
R III	Drift and waif wood ...	25	25	25	25	...	100
R V	Miscellaneous	200	400	1,000	500	...	2,100
	Total Revenue ...	14,825	15,025	18,325	18,025	...	66,200
	Expenditure.						
A I & II	All Sub-heads	1,000	1,000	1,000	1,200	...	4,200
A VI	Live-stock, stores, tools and plant.	25	25	25	25	200	300
„ VII *a*	Roads and bridges	400	600	200	200	...	1,400
„ „ *b*	Buildings	500	500	600	300	...	1,900
„ „ *c*	Other works	25	25	25	25	...	100

Budget Heads.	Particulars.	Range.				Divisional Office.	Total.
		Northern.	Central.	South-Western.	South-Eastern.		
	Expenditure.	Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
A VIII*a*	Demarcation	70	150	100	130	...	450
" " *d*	Working plans	...	...	...	...	50	50
" " *e*	Sowing and planting ...	25	25	25	25	...	100
" " *f*	Fire-protection	150	325	325	300	...	1,100
" " *g*	Other works	50	50	50	50	...	200
A IX	Miscellaneous	10	10	10	10	60	100
	Total A Charges ...	2,255	2,710	2,360	2,265	310	9,900
B I *b*	Superior officers	...	...	...	...	9,600	9,600
" " *c*	Subordinate forest and depôt establishments.	3,600	4,200	3,500	3,400	100	14,800
" " *d*	Office establishments ...	120	120	120	120	2,320	2,800
B II *b*	Superior officers	...	...	...	...	1,200	1,200
" " *c*	Subordinate forest and depôt establishments.	200	200	200	200	600	1,400
" " *d*	Office establishments ...	...	...	...	...	200	200
B III	Contingencies	25	25	25	25	1,400	1,500
	Total B Charges ...	3,945	4,545	3,845	3,745	15,420	31,500
	Total Expenditure A & B ...	6,200	7,255	6,205	6,010	15,730	41,400
	Net Revenue ...	+ 8,625	+ 7,770	+ 12,120	+ 12,015	— 15,730	24,800

APPENDIX I.

Names, Situation and Acreages of Unclassed Forests (para. 26).

Block in which unclassed forests are situated.		Unclassed area.		Remarks.
Serial Number.	Name.	Name.	Acreage.	
6	Naipar	Phurtal	912	
35	Kusmi	Kusmi	462	Independent block.
65	Gopalpur	Gopalpur	718	" "
61	Baheria	Kodal	1,138	
60	Lorhi	Keolari	901	
60	Do.	Obhassilli	1,837	
51	Bandopahar	Bandopahar	163	Independent block.
48	Dasondi	Dasondi	292	" "
49	Bhainskhar	Bhainskhar	274	" "
53	Hardua Hathighat ...	Hardua Hathighat ...	777	
		Total ...	7,474	

APPENDIX II.

The following list contains the most important species found in the forests of this Division. It is by no means exhaustive and the first opportunity should be taken advantage of to compile a complete local flora :—

Vernacular Name.	Systematic Name.
1. Achár	*Buchanania latifolia.*
2. Air, Ail	*Acacia Cœsia.* „ *pennata.*
3. Akol	*Alangium Lamarckii.*
4. Am	*Mangifera indica.*
5. Aonla	*Phyllanthus Emblica.*
6. Astho	*Bauhinia racemosa.*
7. Bahera	*Terminalia belerica.*
8. Báiberang	*Embelia Ribes.*
9. Baichándi	*Dioscorea* sp.
10. Bekal	*Celastrus senegalensis.*
11. Bainsa	*Salix tetrasperma.*
12. Bamura	*Acacia arabica.*
13. Bánda	*Viscum attenuatum.* *Loranthus longiflorus.*
14. Báns	*Dendrocalamus strictus.*
15. Bar	*Ficus bengalensis.*
16. Baranga	*Kydia calycina.*
17. Bel	*Ægle Marmelos.*
18. Ber	*Zizyphus Jujuba.* „ *nummularia.*
19. Bhánt	*Clerodendron infortunatum.*
20. Bhiláwán	*Semecarpus Anacardium.*
21. Bhirara	*Randia uliginosa.*
22. Bhirol	*Indigofera* sp.
23. Bhira	*Chloroxylon Swietenia.*
24. Baonria Chhiula	*Butea superba.*
25. Bija	*Pterocarpus Marsupium.*
26. Biláikand	*Pueraria tuberosa.*
27. Bilsena	*Limonia acidissima.*
28. Chameli	*Jasminum arborescens.*
29. Chila	*Holoptela integrifolia.*
30. Chhind	*Phœnix acaulis.*
31. Chhiula	*Butea frondosa.*
32. Dhámin	*Grewia* sp.
33. Dhawa	*Anogeissus latifolia.*
34. Dhawai	*Woodfordia floribunda.*
35. Dhengan	*Cordia Macleodii.*
36. Dhobain	*Dalbergia paniculata.*
37. Dudhi	*Wrightia tinctoria.* „ *tomentosa.*
38. Dikámali	*Gardenia gummifera.*
39. Aintni	*Helicteres Isora.*
40. Gabdi	*Cochlospermum Gossypium.*
41. Ganger	*Grewia* sp.
42. Ghato	*Schrebera swietenioides.*
43. Ghont	*Zizyphus xylopyra.*
44. Gunchhi	*Abrus precatorius.*
45. Gunja	*Odina Wodier.*
46. Gurár	*Albizzia procera.*
47. Haldu	*Adina cordifolia.*
48. Harra	*Terminalia Chebula.*
49. Harua	*Erythrina suberosa.*
50. Imli	*Tamarindus indica.*
51. Indarjao	*Holarrhena antidysenterica.*
52. Jait	*Sesbania ægyptiaca.*

Vernacular Name.	Systematic Name.
53. Jamnera	*Eugenia salicifolia.*
54. Jamrási	*Elæodendron Roxburghii.*
55. Jámun	*Eugenia jambolana.*
56. Kachnár	*Bauhinia variegata.*
57. Kadam	*Anthocephalus Cadamba.*
58. Kaim	*Stephegyne parvifolia.*
59. Kait	*Feronia Elephantum.*
60. Kakunan	*Celastrus paniculatus.*
61. Kámpthi	*Hiptage Madablota.*
62. Kanji	*Pongamia glabra.*
63. Kanker	*Flacourtia Ramontchi.*
64. Karanj	*Cæsalpinia sepiaria.*
65. Kardehi	*Anogeissus pendula.*
66. Kári	*Miliusa velutina.*
67. Karonda	*Carissa diffusa.*
68. Kasai	*Briedelia retusa.*
69. Kat-umar	*Ficus hispida.*
70. Kau	*Ixora parviflora.*
71. Kenkra	*Garuga pinnata.*
72. Khair	*Acacia Catechu.*
73. Khajuri	*Phœnix sylvesteris.*
74. Khatua	*Antidesma diandrum.*
75. Khirni	*Mimusops indica.*
76. Kirwára	*Cassia Fistula.*
77. Kiwanch	*Mucuna pruriens.*
78. Koha	*Terminalia Arjuna.*
79. Kulu	*Sterculia urens.*
80. Kumbhi	*Careya arborea.*
81. Khumer	*Gmelina arborea.*
82. Kusam	*Schleichera trijuga.*
83. Máhárukh	*Ailanthus excelsa.*
84. Máhol	*Bauhinia Vahlii.*
85. Mahua	*Bassia latifolia.*
86. Menhar	*Randia dumetorum.*
87. Makor	*Zizyphus Ænoplia.*
88. Meda	*Tetranthera laurifolia.*
89. Mendhi	*Lawsonia alba.*
90. Mudár	*Calotropis procera.*
91. Sufed Musli	*Curculigo orchioides.*
92. Nim	*Melia indica.*
93. Ningori	*Vitex Negundo.*
94. Pákar	*Ficus infectoria.*
95. Panwár	*Cassia Tora.*
96. Pápra	*Gardenia latifolia.*
97. Pápri	*Ventilago calyculata.*
98. Pendra	*Gardenia turgida.*
99. Pipal	*Ficus religiosa.*
100. Rámdáton	*Smilax* sp.
101. Rassalla	*Cordia Myxa.*
102. Reunjha	*Acacia leucophlœa.*
103. Rohin	*Soymida febrifuga.*
104. Rori	*Mallotus philippinensis.*
105. Ságon	*Tectona grandis.*
106. Sáj	*Terminalia tomentosa.*
107. Sálai	*Boswellia thurifera.*
108. Seji, Seja	*Lagerstrœmia parviflora.*
109. Semal	*Bombax malabaricum.*
110. Senjna	*Moringa pterygosperma.*
111. Shisham	*Dalbergia latifolia.*
112. Siháru	*Nyctanthes Arbor-tristis.*
113. Siris	*Albizzia Lebbek.*
114. Sitáphal	*Anona squamosa.*
115. Tendu	*Diospyros Melanoxylon.*
116. Tilban	*Premna intergrifolia.*
117. Tinsa	*Ougeinia dalbergioides.*
118. Thuar	*Euphorbia Tirucalli.*
119. Umar, Gular	*Ficus glomerata.*
120. Erma	*Albizzia odoratissima.*

APPENDIX III.

Specification of Areas hitherto treated under Improvement Fellings (para. 47).

Forest year.	Range.	Block. No.	Block. Name.	Acreage felled over.
1892-93 ...	Northern	3	Hathidol	5
	Do.	5	Sukri	10
	Do.	14	Karkohi	15
	Do.	15	Bharkhura	11
	Central	21	Magra	30
	Do.	31	Maria	21
	Do.	38	Rajnagar	8
	Do.	41	Jamunia	9
	Do.	42	Balakot	11
	Do.	46	Somkhera	9
	South-Western	52	Pateriya	20
	Do.	60	Lorhi	22
	Do.	62	Bagdari	20
	Do.	66	Jamun	20
	Do.	70	Sarratura	20
	Do.	75	Dudhia	20
	South-Eastern	85	Deori	30
	Do.	89	Gidra	30
	Do.	94	Silpura	35
1897-98 ...	Central	38	Rajnagar	40
	South-Eastern	84	Singrampur	40
1898-99 ...	Central	31	Maria	8½
	Do.	34	Pateriya	20
	Do.	38	Rajnagar	100
	Do.	41	Jamunia	179
	South-Eastern	84	Singrampur	18
			Total ...	751½

APPENDIX IV.

Average annual Revenue and Expenditure during three-year period from 1896-97 *to* 1898-99 (*para.* 51).

Budget.	Sub-heads.	Northern Range.	Central Range.	South-Western Range.	South-Eastern Range.	Divisional Office.	Total.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
RI *a*	Timber	...	29	...	224	...	253
„ *b*	Firewood and charcoal ...	...	110	1	38	...	149
„ *e*	Grass and other minor produce ...	1,060	10	66	564	...	1,700
RII *a*	Timber	166	317	684	138	...	1,305
„ *b*	Firewood and charcoal ...	109	758	965	335	...	2,167
„ *c*	Bamboos	217	139	74	3,399	...	3,829
„ *d*	Grazing and fodder-grass ...	4,620	3,749	7,371	326	...	16,066
„ *e*	Other minor produce	542	886	603	79	...	2,110
RIII	Drift and waif wood	2	...	3	...	1	6
RV *a*	Fines and forfeitures	...	4	...	...	3	7
„ *b*	Refunds	...	12	7	...	125	144
„ *c*	Other sources	118	193	351	198	43	903
	Total ...	6,834	6,207	10,125	5,301	172	28,639
AI *a*	Timber	4	7	5	68	...	84
„ *b*	Firewood and charcoal ...	...	53	...	29	...	82
„ *c*	Bamboos	...	40	...	...	...	40
„ *e*	Grass and other minor produce ...	459	6	43	238	106	862
AII	Timber and other produce ...	320	394	499	196	1,555	2,964
AIII	Drift and waif wood	...	...	10	...	...	10
AVI c	Purchase of stores, tools and plant	...	1	...	...	108	109
AVII *b*	Buildings	13	117	66	25	...	221
„ *c*	Other works	3	5	...	12	...	20
AVIII *a*	Demarcation	103	227	111	176	76	693
„ *c*	Surveys	...	16	4	6	318	344
„ *d*	Working plans	159	140	192	188	181	860
„ *e*	Sowing and planting	9	73	7	...	12	101
„ *f*	Protection from fire	245	322	263	200	24	1,054
„ *g*	Other works	1	5	...	123	7	136
AIX *a*	Law charges	5	1	3	...	1	10
„ *b*	Other charges	...	7	1	8	17	33
	Total A ...	1,331	1,414	1,204	1,269	2,405	7,623

Budget.	Sub-heads.	Northern Range.	Central Range.	South-Western Range.	South-Eastern Range.	Divisional Office.	Total.
		Rs.	Rs.	Rs.	Rs.	Rs.	Rs.
BI *b*	Superior Officers	...	...	...	...	6,675	6,675
„ *c*	Subordinate establishments ...	2,427	3,765	2,604	1,483	2,452	12,731
„ *d*	Office establishments	28	34	...	...	1,341	1,403
„ *e*	Deputation allowance... ...	...	...	...	...	6	6
„ *f*	Exchange Compensation allowance	...	...	...	...	483	483
BII *b*	Superior Officers	...	...	...	...	848	848
„ *c*	Subordinate establishments ...	158	165	209	90	570	1,192
„ *d*	Office establishments	...	...	...	...	87	87
BIII *a*	Stationery	2	2	...	...	26	30
„ *b*	Carriage of tents and records ...	17	17	19	14	827	894
„ *e*	Official postage	19	5	6	5	223	258
„ *f*	Sundries	212	278	230	155	695	1,570
	Total B ...	2,863	4,266	3,068	1,747	14,233	26,177
	GRAND TOTAL ...	4,194	5,680	4,272	3,016	16,638	33,800

APPENDIX V.—(para. 52.)

The chief marketable products of the Damoh forests and the principal purposes for which they are in local demand are here shown :—

Plough shafts.—Bija, ságon, tinsa.

„ *yokes.*—Ságon, ber.

„ *shares.*—Dhawa, bija.

„ *handles.*—Tinsa, bija, bhira, bilsena.

„ *yoke-pins.*—Dhawa, khair, bija.

Seed drill.—Ságon, khumer, umar (for upper portion), bamboo (for lower portion).

Hoe shafts.—Ságon, tinsa.

„ *handles.*—Dhawa, bilsena.

Clod-crushers.—Tinsa, bhira.

Cart-wheels.—Koha, imli (inferior).

„ *nave.*—Bamura, reunjha, bhira, rassala.

„ *felly.*—Bamura, reunjha, dhawa, tendu.

„ *spoke.*—Bamura, reunjha, tinsa, dhawa.

„ *axles and shafts.*—Ságon, tendu, bhira, dhawa, tinsa, sáj, seji, bel.

„ *platform and sides.*—Wood of all tree species except gabdi, kulu and thuar.

Building timber.—Ságon, dhawa, tendu, tinsa, bhira, jamun, haldu, sáj and, for inferior buildings, wood of almost all tree species except gabdi, kulu and thuar.

Pân gardens.—Bamboos and saplings of all tree species except gabdi, kulu and thuar.

Fencing.—Siharu, ber, ghont, bamboo, karonda and makor.

Wattle-and-daub walls.—Small timber of all tree species except gabdi, kulu and thuar.

Axe-handles.—Dhawa and bilsena.

Combs and measures for grain and oil.—Papra, shisham, dudhi, jamrasi, kaim and tendu.

Pestles for husking grain.—Khair and bhira.

Crushers for oil and sugar-cane mills.—Khair and kusam.

Oil-presses.—Ghato.

Furniture and boxes.—Teak, bamboos, shisham, tendu, khumer, ber and bija.

Picture frames.—Teak.

Boats.—Teak, semal, khumer, umar and haldu.

Gun-stocks.—Teak.

Spindles for cotton-spinning.—Tinsa.

Toys.—Dudhi.

Walking sticks.—Khirni, bamboos and akol.

Gun-fuses.—Kumbhi (bark).

Kanwar shafts and palanquin poles.—Dhamin, bamboos, ber and kári.

Drums.—Bija.

Tambourines.—Bija.

Rulers.—Tendu and khair.

Baskets, sieves, fans, trellis-work, chicks, matting, fishing-rods and snares, fireworks and umbrellas.—Bamboos.

Torches.—Gabdi and kau.

Shoring for wells.—Umar and jamun.

Fuel.—Most esteemed for this purpose are dhaora, khair, bhira, lendia, aonla, ber, ghont and siharu.

Charcoal.—Most esteemed are khair, dhawa, mahua, teak, seja and (for iron-refining) dead bamboos.

Ropes and lashing.—Chhiula root, mahol and aintni bark.

Oil for burning.—Gulli (mahua fruit), bahera and kanji fruit.

Spirits.—Mahua flowers.

Food.—Gum of bamura, khair, dhawa, achar, jamrasi, kait, seji, rohin, koha and sáj; inner bark of reunjha, umar, and senjna; fruit of bel, akol, sitaphal, khatua, mahua, kasai, achar (pulp and kernel), karonda, rassala (fruit and kernel), tendu, báiberang, jamun, kait, bar, pakhar, umar, pipal, kanker, pendra, kenkra, khumer, dhamin, ganger, am (fruit and kernel), khirni, senjna, chhind, khajuri, aonla, menhar, bhirara, bhilawan (hypocarp), rámdáton, imli, dahera (kernel), ningori (kernel,) ber and makor, leaves of khatua, kachnar, panwar, rassala, báiberang, pipal and imli; flowers of mahua, semal, kirwara, rassala, bhirol and senjna; seeds of ashto, mahol, salai, karanj, bamboo, papra, kiwanch and kulu; tender culms of bamboo and semal (tap-root); underground stem of chhind; tubers of musli, baichandi, bilaikand and thikur; honey.

Fodder-grass.—Kail, musel, sukal, sena, guner, bhonr, dub, thikari, sewain, gandhela, chinwanya.

Thatching.—Kans, sukal, sena, guner and bhonr grasses; chhind, mahol, chhiula and teak leaves.

Medicines.—Gum of tendu, dhawa, kulu and semal, musli, thikur, indarjao, meda lakri (bark of meda), kakunan (leaves and seeds), kirwara, rasalla (fruit), jamrasi (bark), gabdi (leaves), gunchhi (root), honey, báibérang, &c.

Weights.—Gunchhi (seeds).

Dyeing and Tanning.—Leaves of dhawa, aonla and jamrasi; fruit of harra, ghont and bahera; bark of sáj, koha, kirwara, bamura, rohin, ber, khair, pipal, achar, tendu and bija; flowers of dhawai, siharu and chhiula.

Stuffing for pillows and cushions.—Semal cotton.

Other arts and manufactures.—Lac, gums, wax, horns, hides, bones and katha.

APPENDIX VI.

Schedule of Forest Rates for Agricultural Requirements prescribed by Chief Commissioner's Resolution No. 102, *dated 5th January* 1893 (*para.* 58).

NOTE.—This schedule applies only to Central Provinces cultivators, ryots, day-labourers, village artisans and village servants for domestic use.

Class of Forest Produce.	Rate per ton of 50 c. ft.	Approximate rate per c. ft.	Rate per ton of 27 maunds.	Rate per head-load of 30 seers.
(A)—Timber Class I.—*Teak and Bijasal.*	Rs. a. p.	Rs. a. p.	Rs. a. p.	Rs. a. p.
Poles 10′ × 9″ girth at thick end				
„ 12′ × 12″ „ „	15 0 0	0 5 0	...	...
„ 16′ × 18″ „ „				
„ 20′ × 24″ „ „	17 0 0	0 5 6	...	...
Class II.—*Sáj, Sál and Shisham.*				
Poles 10′ × 9″ girth at thick end				
„ 12′ × 12″ „ „	9 8 0	0 3 0	...	...
„ 16′ × 18″ „ „				
„ 20′ × 24″ „ „	11 0 0	0 3 6	...	...
Class III.—*All other kinds not specially excepted by order of the Conservator.*				
Poles 10′ × 9″ girth at thick end				
„ 12′ × 12″ „ „	5 0 0	0 1 6	...	...
„ 16′ × 18″ „ „				
„ 20′ × 24″ „ „	6 0 0	0 2 0	...	...
NOTE.—Poles of intermediate girths will pay the next highest rate.				
(B)—*Minor Forest Produce.*				
Firewood felled from green trees	...	...	0 6 0	0 0 2
„ dead-wood picked in forests ...	...	...	0 3 0	0 0 1
Thorns	...	...	0 3 0	0 0 1
Fodder-grass	...	...	0 3 0	0 0 1
Leaves	...	...	0 3 0	0 0 1
Bamboos, green	...	...	0 12 0	per cent.
„ dry	...	...	0 4 0	„
(C)—*Grazing.*				
NOTE.—Calves under a year are free.				

Forest Division.	Rate per head of—			
	Buffaloes.	Cows, oxen or ponies.	Goats.	Sheep.
	Re. a. p.	Re. a. p.	Re. a. p.	Re. a. p.
Damoh	0 4 6	0 2 6	0 1 3	0 0 9

APPENDIX VII.

Schedule of actual Selling Rates (see para. 58).

Class of Forest Produce.	For forests situated in immediate vicinity of Saugor District Boundary.	For forests situated in immediate vicinity of Saugor-Damoh-Jubbulpore metalled road.	For remaining forests of the Division.	REMARKS.
	A.—TIMBER RATE PER TON.			
	CLASS I.			
	Teak, bija and tinsa.	*Teak, shisham and tinsa.*		
	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Poles 10'× 9" girth thick end ...	3 5 4	7 8 0	5 0 0	* The rate for Singrampur has been reduced to Rs. 8 per ton.
" 12'×12" do. ...	4 0 0			† These rates also apply to bhirra in forests situated near the Saugor border.
" 16'×16" do. ...	5 0 0			
" 20'×24" do. ...	...	...	...	
" 22'×30" do. ...	6 0 0	9 0 0*	6 0 0	
" 24'×36" do. ...	...	...	...	
	CLASS II.			
	Saj and shisham.	*Saj and bija.*		
	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Poles 10'× 9" girth thick end ...	2 3 6	5 0 0	3 5 4	
" 12'×12" do. ...	2 10 0			
" 16'×18" do. ...	3 0 0			
" 20'×24" do. ...	...	...	...	
" 22'×30" do. ...	3 9 0	6 0 0	4 0 0	
" 24'×36" do. ...	...	...	...	
	CLASS III.			
	Other species except bhira.	*Other species.*		
	Rs. a. p.	Rs. a. p.	Rs. a. p.	
Poles 10'× 9" girth thick end ...	1 15 6	3 0 0	2 3 6†	
" 12'×12" do. ...	2 0 3			
" 16'×18" do. ...	2 2 6			
" 20'×24" do. ...	...	...	...	
" 22'×30" do. ...	2 6 3	4 0 0	2 10 9†	
" 24'×36" do. ...	...	...	...	
	B.—MINOR FOREST PRODUCE.			
	Rate per ton of 27 mds. / Rate per head-load of 30 seers.			
	Rs. a. p. / Rs. a. p.			
Firewood felled from green trees ...	0 4 6 / 0 0 1½	As per Chief Commissioner's Schedule.	As per column 2 for forests in vicinity of Saugor district boundary.	
Bamboos, green, per cent. ...	0 10 0 / ...			
" dry "	0 3 0 / ...			
	Otherwise as per Chief Commissioner's Schedule.			

(a) Poles above 18" girth will not be sold by head-load, but by number of pieces.

(b) One cart-load = 12 head-loads.

(c) One head-load = 30 seers.

(d) One Dhusar = 4 head-loads.

(e) Rates for dead and defective timber are generally a third less than those for sound straight timber of the same class.

(f) The rates for grazing are identical with those given in Chief Commissioner's Schedule.

The grazing rates for Nomadic cattle are as follows :—

	Rs. a. p.	
Buffaloes	0 8 0	per head.
Cows and oxen	0 4 0	"
Goats	0 1 6	"
Sheep	0 2 0	"

The commutation rates are as below :—

Non-cultivators.	Rs. a. p.	Cultivators.	Rs. a. p.
1st Class family, 1 to 4 men ...	... 0 3 0 ;	1st Class on one plough ...	0 5 0
2nd " 5 " 8 " ...	... 0 7 0 ;	2nd " two " ...	0 10 0
3rd " above 8 " ...	... 0 14 0 ;	For every additional plough being in excess of 2 ploughs ...	0 2 0

APPENDIX VIII.

Strength, Distribution and Cost of Sanctioned Establishments (see para. 59).

Appointment.	Distribution and monthly cost.												
	Salary.	Northern Range.		Central Range.		South-Western Range.		South-Eastern Range.		Divisional Office.		Total.	
						Out-door Staff.							
Ranger	125	...	...	...	...	...	...	...	...	1	125	1	125
Deputy Rangers ...	40	1	40	...	...	...	...	...	...	...	...	1	40
	30	...	...	1	30	1	30	1	30	...	...	3	90
Foresters	25	...	...	...	...	1	25	1	25	...	...	2	50
	20	...	...	...	...	1	20	1	20	...	...	2	40
	15	1	15	1	15	...	...	...	...	...	...	2	30
Forest Guards	12	2	24	3	36	1	12	1	12	...	...	7	84
	10	2	20	1	10	4	40	5	50	...	...	12	120
	8	5	40	14	112	3	24	..	...	...	...	22	176
	7	8	56	10	70	7	49	3	21	...	...	28	196
	6	7	42	3	18	5	30	3	18	1	6	19	114
	5	10	50	9	45	10	50	13	65	...	...	42	210
						Office Staff.							
English clerks	30	...	...	...	...	...	...	...	...	1	30	2	45
	15	...	...	...	...	...	...	...	...	1	15		
Vernacular clerks ...	20	...	...	...	...	–	...	...	...	1	20	4	48
	10	...	...	...	...	...	...	...	...	2	20		
	8	...	...	...	...	...	...	...	...	1	8		
Range moharrirs ...	15	...	...	...	...	...	...	...	...	1	15	2	25
	10	...	...	...	...	...	...	...	...	1	10		
Orderlies	6	..	...	...	...	...	...	...	...	2	12	3	17
	5	...	...	...	...	...	...	...	...	1	5		
Draftsman	20	...	...	...	...	...	...	...	...	1	20	1	20
						Contingent Staff.							
Dâk runner	6	...	–	...	...	...	...	...	...	3	18	3	18
Tent lascar	6	...	...	...	...	...	...	...	...	1	6	1	6
Sweeper	1	...	...	...	...	...	...	...	...	1	1	1	1
Pankha coolies	5	...	...	...	...	...	...	...	...	2	10	2	10
Tatti cooly	4	...	...	...	...	...	...	...	...	1	4	1	4
Total ...		36	287	42	336	33	280	28	241	22	325	161	1,469

Abstract of monthly cost according to Budget sub-heads.

	Rs.	a.	p.
AII	12	0	0
BI *c*	1,263	0	0
„ *d*	155	0	0
BIII *b*	24	0	0
„ 6	15	0	0
Total ...	1,469	0	0

APPENDIX IX.

Establishment of Katha-boiling Circles (paras. 24 and 104).

Letter No. 3128-31, *from* E. E. Fernandez, Esq., *Conservator of Forests, Northern Circle, Central Provinces, to the Divisional Forest Officers, Jubbulpore, Damoh, Saugor and Narsinghpur, dated Jubbulpore, the* 13*th June* 1900.

The katha-boiling industry has been carried on in a spasmodic way in the first three districts named above for many years past by professional gangs calling themselves *khairwas*, but has never hitherto received from the Forest Department the encouragement it deserves, and has also suffered from the absence of any kind of systematic regulation.

2. The khair tree does not with us attain any size, and although gregarious, never forms dense masses of more or less pure forest. The wood is highly esteemed locally for small house-props and for certain agricultural implements. To give to the katha-boiler wood suitable for such purposes would of course be a mistake from both the financial and economic points of view, but for every tree capable of yielding useful timber there are at least ten others which, if cut at all, would go out as mere fuel if it was not possible to persuade the katha-boiler to come and turn it to better account.

3. The katha-boiler himself is neither enterprising nor rich enough to carry on his industry on his own initiative and with his own resources. He is a mere labourer, and his employer is always some well-to-do person with commercial instincts, who expects an adequate total net return for his money and trouble. The yield of katha is in any case small (barely 7% of the weight of the heart-wood used) and a single labourer can prepare only a small quantity in a season. Thus the lessee must work on a large scale and employ a more or less considerable gang. Such being the case, and our khair forests, as said before, not being rich in utilisable material, a season's operations necessarily require a large area of such forest. If to this we add the fact that khair is a very slow grower, it becomes obvious that in order to give a single gang constant employment (*a sine quâ non* for systematic and effective work), we must provide it with a very extensive area. If, for instance, khair takes thirty years to attain a sufficient size for the katha-boiler's purpose, a single gang will require for itself thirty times the area it would work over in one year. It is failure to appreciate this very obvious condition that is responsible for the present very unfavourable position of the industry.

4. It is thus obvious that a katha-boiling circle, *i.e.*, an area sufficient to give constant occupation to a single gang of boilers, must be a working unit entirely distinct from felling series or a working circle composed of felling series. Indeed, in view of our very limited resources in workable khair, it is possible that a single katha-boiling circle may extend beyond the limits of a single Division.

5. The establishment of katha-boiling circles, however, postulates the following previous knowledge :—

(i) We must know the greatest distance from their camp to which khairwas will go for their wood. This will give us the maximum area that can be adopted for one season's operations.

(ii) The minimum outturn of katha that, at ruling prices, will satisfy a lessee must be ascertained. It is evident that the area under (i) must contain *at least* a sufficient number of *available* khair trees to produce this minimum quantity. The word "available" above is used advisedly to include all trees of sufficient size for katha manufacture, which are not required for timber.

(iii) The minimum specified under (ii) cannot be calculated unless by previous careful experiment or survey, as the case may be, we know (*a*) the approximate number of khair trees at the disposal of the katha-boiler, (*b*) the approximate quantity of heart-wood contained on an average in each tree, and (*c*) the percentage of yield of katha obtained from a given weight of heart-wood.

(iv) We must have determined approximately the respective ages at which khair seedlings and coppice shoots attain in these parts the average girth suitable for the katha-boiler. This information will indicate the number of coupes (areas assigned to successive years) to be included in a single circle.

(v) The girth at the base, after attaining which khair, as a rule, ceases to throw up coppice shoots, must be known. It is evident that if most of the trees of the minimnm size required by the katha-boiler have necessarily passed the limit of coppicing age, work after a single rotation will become impossible, except a new generation of trees can with certainty and at little cost be raised from seed.

(vi) All areas containing more or less abundant khair should, after careful examination, have been shown on the published maps on the scale of 4 inches = 1 mile. It does not follow that all these areas will be fit to be included in the katha-boiling circle. Some may be too limited in extent and too far away from other khair areas to be utilisable; others may be unsuitable owing to the absence of a sufficiently near supply of water, and so on.

(vii) All perennial sources of water within or just outside khair areas should also have been marked on the map as possible sites for katha-boiling.

6. I accordingly beg that you will at once set about collecting the information detailed above and will report fully to this office on 15th August each year for the next two years (1901 and 1902) all the *data* thus brought together. I will then, in communication with you, decide whether matters are ripe for the framing of a katha-boiling working plan, which, it is possible, may embrace all four Divisions. In order to obtain accurate data it will be necessary for you to carry on katha-boiling operations each year on a small scale under the direct supervision of a subordinate who understands the value of accuracy and to give to them as much of your personal attention as possible.

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